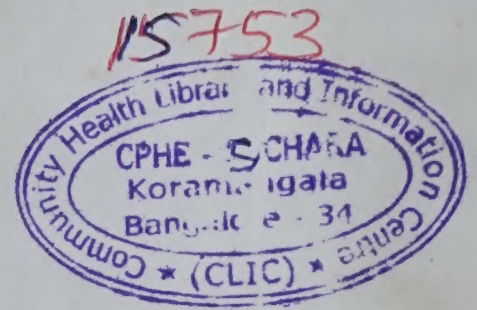


A STUDY ON THE OPINION OF INDUSTRIAL
WORKERS ON THEIR PARTICIPATION IN
SAFETY ACTIVITY IN A SELECTED
FACTORY IN BANGALORE, KARNATAKA

EDWINA WASHINGTON

RAJKUMARI AMRIT KAUR COLLEGE OF NURSING
UNIVERSITY OF DELHI
APRIL 1986



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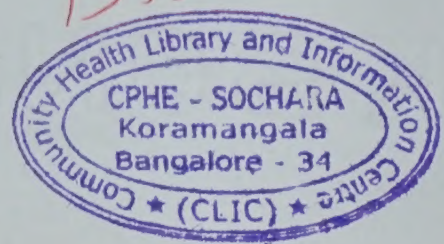
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at the

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Submitted in partial fulfilment of the

requirement for the Degree of

Master of Nursing from the

University of Delhi

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ACKNOWLEDGEMENT

The investigator wishes to express her sincere appreciation to her honourable advisors Mrs. Sumitra Srivastava, Senior Lecturer in Psychology and Ms Krishna Kumari Gullari, Senior Tutor in Community Health, for their valuable and patient guidance that sustained and stimulated deep interest in her study. She wishes to thank Dr Aparna Bhaduri, Professor of Nursing for helping her conceptualize the study. She is indebted to the team at Regional Occupational Health Centre at Bangalore who contributed their valuable time and effort towards shaping the study.

She is thankful to Mr. E.J. Ferdinand for helping her in developing the tool. She is thankful to the Chief Medical Officer, Managers, and workers of the Bharat Electronics Limited, Bangalore for extending full cooperation to her in collecting the required information for the study. She especially expresses her sincere thanks to Dr. C.P. Behrotra, Reader, Central Institute of Education, for his expert statistical guidance.

She is thankful to Miss J. Rodericks and Mrs. M. Rodericks for patiently editing her study.

Mr. J.C. Mahajan deserves special word of thanks for typing her study. She wishes to express her sincere thanks for the encouraging support extended to her by her family and all friends who helped her make the present study possible and useful.

Eduina Washington

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CHAPTER I

INTRODUCTION

More than 100 years ago, the exploitation of workers was stemmed by successful negotiations from Karl Marx. Today, worker participation is at the centre of all industrial development.¹ More than 100 years ago, the work-force was considerably less. Today, the ratio of health personnel and health facilities for the work force are considerably less.² Nearly 50 years ago, it had been aptly stated that industrial nursing was the 'springboard' for the advancement of safety.³ Today, work intensification and technical progress has metamorphosized such that the advancement of safety calls for a multi-dimensional approach.⁴

¹ Report of the First National Conference on Occupational Health Issues and Priorities, Toronto, Feb 25-26, 1976, Canadian Journal of Public Health, Vol.67 Supp.2, 1976, p.2-15.

² K.K. Das, "Medical Officer in Industry - A Study of the Extent and Scope of his Functions and a Recommendation," Journal of the Indian Medical Association, Vol.42, No.7, 1964, pp. 326-336.

³ Roland P Blake, "Industrial Safety," New York: Prentice Hall, 1963, p.7.

⁴ H.C. Ramarathan, M.N. Gupta, B.B. Chatterjee and M.N. Rao, "Occupational Health Research in India - A Review," I.C.M.H. Publication, 1970, p.1-3.

No one needs another Bhopal¹ to remind them that industrial health problems are associated with progress. No one needs another Bhopal to remind them that industrial safety activity is unorganized.² No one needs another Bhopal to try out a new approach that has shown positive results else where, that is , worker participation in safety activity.³

If industrial nurses have to remain the 'springboard' for the advancement safety, she must realize that the promotion of safety must involve all industrial employees; the management at the top, as well as, the frontline worker in the shop floor.

¹ Report on the Union Carbide Factory, Bhopal, MIC gas leak in various News papers dated November 4th, 1984 and India Today fortnightly issues dated Nov. 15th to 30th, 1984.

² M.N. Gupta, "Health Aspects of Industrialization in India," Social Action, May-June, 1963, pp.259-267.

³ Hideyasu Aoyama, "Worker Participation in Occupational Safety in Japan," International Labour Review, Vol.12, No.2, Mar-Apr, 1982, pp. 207-216.

our democratic culture, but a defining characteristic of our culture is, hence, imperative.¹ For the workers, the job is a major part of their cultural environment, and they, therefore, seek to satisfy their needs through their work.² But as Rutterberg³ remarks, the workers are 'emotionally dissatisfied, intellectually dissatisfied and economically dissatisfied...at having to respond to technologic changes that they do not originate.' One of the fundamental impulses in a man is 'self-expression', he added. Worker participation in safety activity could be an answer to this. Workers' 'self-expression'^{through} participating in safety activity, is hence needed.

The health of the labour force and safety are of 'common concern to all countries'.⁴ However, several studies have substantiated that there is no recognizable

¹
ibid., p.540.

²
R.K. Merton, "The Machine, the Worker and the Engineer", Science, Vol.105, pp. 79-84.

³
H.J. Rutterberg, National Research Council Conference, 1941, as in David Kretch and Richard S. Crutchfield, op.cit., 543.

⁴
W.D. Phoon, loc. cit.

pattern of occupational health services in India.¹ Since the genesis of the National Institute of Occupational Health in Ahmedabad and its regional office in Bangalore, efforts are being made in this direction through organized research.² With a work load of one health personnel in industries ranging from 616 to 3500 workers for nearly 100 percent curative services, the picture looks far from bright.³ With a 'gap existing between the production of manpower in required quantities and their appropriate allocation to the health service organizations, difficulty in understanding why any priority should be given to occupational health is still persisting in developing countries.⁴ Worker participation in safety activity would help lessen the load on the health personnel existing and be a parallel to what community participation is in many community health projects;⁵ and equally successful in promoting safety. A study on what the workers feel about participating in safety activity is hence required.

¹ S.A.Kelkar, "Ergonomics: Worker Protection and Rehabilitation", *Indian Journal of Rehabilitation*, Asia, Vol.10, No.1, 1977, pp.4-4.

² H.C.Ramanathan, M.N.Gupta, B.B.Chatterjee and M.N.Rao, "Occupational Health Research in India - A Review", I.C.M.R. Publication, 1970, p.10-23.

³ K.K.Das, loc. cit.

⁴ V.D.Phoen, loc.cit.

⁵ J.P.Naik, *Alternative Strategies to Health..*(3 lines)

It is a well known fact that there is a long way between the perception of the first symptom until the recognition of a disease by the medical system. This implies that, the recognition of diseases tends to happen faster when the workers themselves are involved.¹ This is a viable possibility in industries only if workers participate in safety activity. This study is hence necessary.

A recommendation by the Canadian Public Health Association stressed that new approaches are needed to prevent occupational diseases and injuries. They suggested that 'worker participation may prove some of this new approach'.² This study, hence, needed to find out what the workers thought about this 'new approach'.

Studies on worker participation have reported that participation enhances worker motivation towards the goal.³ It results in developing workers need for self-

¹
W.D. Phoon, loc. cit.

²
Canadian Public Health Association, First National Conference on Occupational Health Issues and Priority, Toronto, Feb. 25-26, 1976, Canadian Journal of Public Health, 1976, 6 Vol. 67, Supp2, p.77.

³
Paul de Barker (ed), "Interaction-Nine Studies," Oxford: Bruno Cassirer Ltd., 1969.

expression, self-esteem and identification.¹ It reduces the resistance to change and helps in the implementation of the task.² Hence, worker participation in safety activity was expected to lead to motivating the workers towards safety, reducing their resistance to any safety specification laid down, and facilitating implementation of the planned safety activity. Studies have also reported that, not participating leads to 'dissatisfaction' and 'brooding' which have serious repercussions where safety management is concerned.³

Participation in safety activity is dependent upon, among other factors, the subjective willingness of the workers.⁴ This study, hence, seek to explore the opinions of workers on participating in safety activity.

¹ R.Tannerbaum and F. Massarik, "Participation by Subordinates in Managerial Decision Making Process," Canadian Journal of Economics Political Science, 1950, Vol.16, pp 408-418, as in R.C.Srivastava, "Educational Decision Making," New Delhi: Metropolitan Books Co; 1983, p.34.

² L.Coch and J.R.P. French, "Overcoming resistance to change," Human Relations, Vol.1, 1948, pp.512-532.

³ David Kretch and Richard S. Crutchfield, op.cit., pp 500-550.

⁴ J.R.P. French, Jr., J.Israel and D.Aas, "An Experiment on Participation in a Norwegian Factory," Human Relations, Vol.36, No. , pp.151-166.

Conceptual Frame-work

The theory base for the development of the conceptual framework for the study is primarily Martha Rogers.

¹
According to Rogers, Nursing seeks to promote 'symphonic interaction between man and his environment', strengthen the coherence and integrity of the human field and direct the patterning of the human and environmental fields, for the realization of maximum health potential. In an industrial situation, the worker ('unitary man') 'co-participates with the environment in creating and becoming'; he is whole, open and free to choose ways of living health.²

This study seeks to determine and describe the opinion of workers ('free choice') on participating in safety activity. The model shows that, in order to promote 'symphonic interaction between the worker and his environment', management safety activity and worker safety activity have to complement each other. Safety

¹
Martha E Rogers, "A Science of Unitary Man". as in J.P. Riehl and Callister Roy, "Conceptual Models for Nursing Practice," New York: Appleton Century Crofts; 1980a, 2nd edition, p.

²
R.A. Parse, "Man-Living-Health: A Theory of Nursing," New York: John Wiley and Sons Inc; 1981a, p.7.

activity in an industrial situation is imperative. It is a dynamic force influencing the occurrence of industrial health problems. The management safety activity must exist even if the workers are unwilling to participate in safety activity. However, if workers are willing to participate in safety activity, this should be utilized for the promotion of safety. They would choose to either actively participate or passively participate in safety activity. The workers willingness to participate will depend on several factors, such as age, professional training received, pay they receive, how they perceive their working conditions, their work and outcome of participating¹ and whether they work alone or not.

Nursing activity, which is predicted upon the wholeness of man, derives its concept of safety from a unified concept of human function - the worker, the management or both. Nursing is concerned with evaluating the simultaneous states of worker and management safety

1

Ruth Kanfer and P Christopher Earlier, "The Influence of Component Participation and Role Models on Goal Acceptance, Goal Satisfaction and Performance," Organization Behaviour and Human Decision Process, Vol.35, No.3, June, 1985, p.378.

Persons that include workers' willingness and ability to participate in safety activity



Improving action that facilitates in increasing safety.

Persons Participation in Safety Activity

Persons Participation in Safety Activity

Key : A : Management Safety Activity
B : Workers Passive Participation.
C : Workers Active Participation.

activity, as well as, the environment, for the optimal promotion of safety. Nursing activity, hence implies keeping abreast with the existing safety activity, workers their felt health needs and problems, and then facilitating the management to encourage worker participation in safety activity.

The conceptual frame-work is based on the
¹
 Principle of Helicy which states that the nature and direction of human and environment change is continuously innovative, probabilistic, and characterized by an increasing diversity of human field and environment field patterns. The organization emerging out of these two fields manifest non-repeating rhythmicities. In the industrial situation, technologic advances, special forces and the facilities for safety determine the environment field pattern. The workers-workers and workers-management, others determine the human field pattern.

The conceptual framework is also based on the
²
 Principle of Complementarity which states that the interaction between human (worker, management) with environment fields (industrial situation) is continuous, mutual and simultaneous.

¹
 Martha E Rogers, loc. cit.

²
 Martha E Rogers, loc. cit.

The model seeks to investigate and promote the safe utilization of existing skills and technologies (the worker and the Management) towards a multi-directional approach to safety management.

Statement of the Problem

The study aims to find out the opinion of industrial workers on their participation in safety activity in a selected factory in Bangalore, Karnataka.

Objectives of the Study

1. To find out the perception of workers on the existing industrial health problems in their unit.
2. To find out the perception of workers on the existing safety activity in their unit.
3. To describe the opinion of the workers on participating in safety activity.
4. To compare the expressed willingness of workers to participate in safety activity and selected factors, namely workers reported age, training received, nature of work, knowledge of the Factories Act of India, 1948., Perception of their working condition, and expected benefits and outcome of participating in safety activity.

5. To find out the outcome of participating in safety activity, expected by workers.

Delimitations

1. The field of study is delimited to one industry, that is, Bharat Electronics Limited, Bangalore, Karnataka.
2. The study deals with the safety activity and industrial health problems, as reported by the workers.
3. The study deals with the opinion of front-line workers willing to participate in the study.

Definitions of terms used in the study.

1. Industry : Place where goods are manufactured with the help of machines and through the process of material by man.
2. Front-line Workers: men or women working directly with and handling materials and machines for the manufacture of goods in an industry.
3. Industrial Health Problems : conditions injurious to the health of a worker and prevailing in an industry, that is, physical, psychological and diseases.
4. Safety Activity: actions taken to prevent industrial health problems.

5. Passive participation : workers express willingness to 'learn more about safety', 'take care of themselves for safety' and 'seek help if needed to promote safety'.
6. Active participation : workers express willingness to organize selected safety activity in addition to 'willingness to learn more about safety' take care of self for safety' and/or seek help, if needed, to promote safety.
7. Participation : workers join actively or passively in safety activity.
8. Choice of Participation : Workers expressed willingness to participate in safety activity, actively or passively.

Basic Assumptions

1. Bharat Electronics Limited is constructed according to the specifications of the Factories Act of India, 1948, keeping in mind the safety of the workers.
2. During the process of handling materials and machines, there is a likelihood of industrial health problems to the workers.
3. Worker participation in safety activity will help prevent industrial health problems.

Presentation of the Report

The present chapter introduces the study. Review of literature is presented in the second chapter. The third chapter outlines the methodology adopted for the study. The analysis and interpretation of the data are presented in the fourth chapter. The final chapter deals with the summary, conclusions, implications, limitations and recommendations for further studies.

CHAPTER II

REVIEW OF LITERATURE

"The scientific review purports to be many things to many people. It may be a pedantic parade of scientific progress, a periodical recapitulation of important related information, or a compendium of current literature."¹

Several studies relating to the occurrence of industrial health problems, safety activity and participation conducted in a kaleidoscope of industrial settings are discussed here, according to the objectives of the study, under the following headings :

Literature on :

- i. existing industrial health problems
- ii. existing safety activity
- iii. worker participation in safety activity
- iv. worker participation in other spheres and their outcomes

¹ N.C.Ramanathan, M.N. Gupta, B.B.Chatterjee and M.N.Rao, "Occupational Health Research in India - A Review 1963-1968" I.C.M.A., 1970, p.1.

Literature on existing industrial health problems

A case control study of occupational hand injury was¹ conducted by Hertz and Emmet in an effort to identify risk factors for disabling injuries. The sample selected were municipal employees who had sustained restricted activities or lost work time as a result of hand injuries. Each case was individually matched to the control employee of the same sex, job, and who was present on the job the date and time the injury took place. A conditional logistic regression model was used to adjust for confounding variables. Performing a task that was not a usual job requirement, using defective materials, presence of cardio-vascular disease, sleeping nine hours, and more per night, and being less than 25 years of age were identified as risk factors after adjustment.

While the aim of the study under review was to find out the risk factors for hand injuries, the present study aims to identify existing health problems perceived by the workers as information towards their participation in safety activity. The study under review found age, sleeping pattern, using defective materials to be risk factors. The present study incorporates this information in the tool developed and in its analysis.

¹

Robin P. Hertz and Edward A Emmet, "Risk Factors for Occupational Hand Injury" *Journal of Occupational Medicine*, Vol.28, No.1, Jan., 1986, pp.44-50.

Another study of relevance here deals with workers working with electricity. The results of a health questionnaire interview with 390 electricians, together with long term estimates of their exposure to 50 Hertz electric fields were reported in a study by Broadbent, Broadbent¹ and Jones. The results showed a significant difference in the health measures between different category of jobs, different parts of the country and in association with factors such as working alone, frequently changing shifts.

Though the study under review differs in nature and approach with the present one, the findings bring out the effects of electric fields on workers. The present study utilizes a sample of workers working with electricity also. Factors such as working alone, hours of work per week, shift work are included in the tool.

Jaikineki - Kruza reports² on a Japanese team who studied transient myopia by measuring contrast sensitivity to a sinusoidal modulated grating pattern.

¹
D.E. Broadbent, M.H.P. Broadbent and M.R.L. Jones, "Health of the Workers Exposed to Electric Fields," British Journal of Industrial Medicine, Vol.42, No.2, 1985, pp. 75-82.

²
W. Jaikineki-Kruza, "Transient Myopia after Visual Work," Ergonomics, Vol.27, No. 11, Nov., 1984, pp. 1184-1190.

They hypothesized that, after viewing for several hours, observers would become temporarily myopic. Following three hours of editing text of a visual display, a significant decrease in sensitivity was found in five out of seven subjects.

The present study also deals with workers viewing panels for soldering at near distances for several hours. One of the problems expected, as indicated by the study under review, is vision problems, which is included in the tool.

A study by Bogdanov and Korovina¹ showed that the incidence of chronic non-specific lung disease was higher in workers of some industrial plants than that of city population not working in these plants. Unfavourable working conditions were the etiological causes.

The present study tries to find out workers' opinion of their working condition and their perception of respiratory problems in their unit.

¹
N.A. Bogdanov, O.V. Korovina, "Lung Diseases in Industrial Plants," *Prob. Tubercul.*, No.3, 1984, pp.16-20 as in *Safety Science Abstracts*, Vol.5, No.10, p.220.

¹
Boxer, Singal and Martle¹ investigated an outbreak of illness in electronics plant workers using a questionnaire. Ninety eight employees had experienced light-headedness, headache, sleepiness, numbness, and tingling of face and extremities. Attack rates by work station found no apparent pattern. Compared with all well employees, ill employees were more commonly female, complained frequently of bothersome odours and believed that greater dangers existed in the illness occurring. The poorly defined nature of illness, absence of exposures to environmental contaminants in concentrations exceeding the recommended limits and evidence of hyperventilation suggested that this was an outbreak of psychogenic illness.

The present study also attempts to elicit workers' opinion on psychological problems existing in their unit. The setting in the present study, like in the study under review, is an electronics factory.

¹
P.A. Boxer, R. Singal, R.W. Martle, "Epidemic of Psychogenic Illness in an Electronics Factory," Journal of Occupational Medicine, Vol.26, No.5, May, 1984, pp. 381-385.

Several studies have been conducted to show the occurrence of industrial health problems, like burns¹ (Markodi, 1964), and skin (Rao and Banerjee, 1952)². The present study deals with the industrial health problems as reported by the workers themselves.

Literature on existing safety activity:

Several studies have been documented on the reasons for the occurrence of industrial health problems. Most studies allude to inadequate safety activity as the main factor in existing industrial health problems.

³ Gupta reported a poor working conditions as the main cause of occurrence of industrial health problem. Similar findings are reported by Sen.⁴

¹ V.C. Markodi, "Incidence of Burns in an Iron and Steel Industry," Indian Journal of Industrial Medicine, Vol.10 1964, pp.8-14.

² M.N. Rao and A. Banerjee, "Does Occupational Dermatitis exist in Indian Industries?" Indian Medical Gazette, Vol.67, 1952, p.265.

³ M.N. Gupta, "Programs and Perspectives in Occupational Health Research in India," Health and Welfare Souvenir, BCL, Bangalore, 1966.

⁴ R.N. Sen, "Environmental Factors Affecting Health of Workers in Industries," Indian Labour Journal, Vol.6, No.9, pp.1-12.

Poor health services for the workforce were the reasons cited by Bhatia¹ in a study in the Okhla Industrial Estate, New Delhi. Similar reportings by Das² substantiate Bhatia's findings on the paucity of health services for the workers.

That workers' themselves indulge in unsafe acts resulting in occurrence of industrial health problems was reported by Mukhopadhyaya and Sircar.³

All above studies indicated that existing safety activity is rudimentary. The present study finds out the stuff of existing safety activity in the factory from the recipients of any safety activity—the workers themselves.

¹ J.H. Bhatia, "A Preliminary Survey to Evaluate the existing Environmental Conditions and Medical Care Facilities in Industrial Establishments of Okhla Industrial Estate," Unpublished MD Thesis, AIIMS, 1963.

² Das, "Medical Officer in Industry, A Study of the Extent and Scope of his Functions and a Recommendation," Journal of the Indian Medical Association, Vol.42, No.7, 1967, pp. 326-336.

³ R.V. Mukhopadhyaya and A.B. Sircar, "A Case Study of Accident Trends in an Engineering Factory," Alumni Association Bulletin of the All India Association of Hygiene and Public Health, Calcutta, Vol.18, No.36, pp.3-6.

Studies on Participation in Safety Activity

A mail survey was conducted by the Department
¹
 of Hygiene, Okayama University Medical Sciences to evaluate the extent of union participation in safety activity. The study used sixty-nine public agencies and one hundred and sixty-two private enterprises as its sample. Response from fifteen public agency unions (response rate 27.5 percent) and thirty-two private enterprise unions (response rate 19.8 percent) showed that the level and nature of union participation differed according to the number of workers employed in the enterprise but not in the type of enterprise.

The present study on the opinion of workers on participating in safety activity is based in one type of factory specifying criteria including number of workers employed.

The Japan National Railway Union, in conjunction
²
 with four other locals, organized a work-site inspection team, in which several outside specialist were invited

¹
 Hideyasu Aoyama, "Worker Participation in Occupational Safety in Japan," International Labour Review, Vol.12, No.2, Mar-Apr, 1962, pp.207-216.

²
 Ibid.

to investigate workers' complaint of low back pain suspected to be occupational ^{at its origin. They used a questionnaire} designed by the Japan Association of Industrial Health, on 4662 workers in 5 shops the study revealed that the causes for 41.8 percent workers suffering from back pain and 18.8 percent of them being absent from work because of it were,

1. handling of heavy objects (47.2 percent)
2. working in half-sitting position (37.4 percent)
3. torsion of the spinal cord (6.5 percent) and
4. other (18.9 percent)

The union presented these findings to the management and the results were positive. The number of workers suffering from back pain decreased. The number of industrial accidents also decreased. The study also showed that the initial increase as workers became more diligent about reporting small accidents followed a steady decrease with improvement of work practices and equipment.

The present study aims to find out how willing workers are to participate in safety activity. The present study looks at worker participation as active participation and passive participation. In active participation, the workers are asked to express their willingness and ability to report risk factors,

while in the study under review, the workers reported small accidents. The results of worker participation in the study under review is the basis for the present study.

Participation in other Spheres

¹
Gass conducted a one year survey research and demonstration project on 20 men. He found that the causes for industrial health problems in workers were frequently obscure, but were related to workers'

1. poor motivation
2. non-compliance with rules
3. tendency to disappear, (to drop-out), and
4. fear of success.

A number of researches in the area of employee and worker participation in business enterprises and industries have led H. Tannerbaum and Massarik ² to conclude,

¹
Gertrude Zemon Gass, "Hard Core Personality and Industrial Illness and Accidents," International Journal of Industrial Medicine and Surgery, Vol.30, No.4, Apr., 1970, pp. 174-179.

²
R. Tannerbaum and F. Massarik, "Participation by subordinates in Managerial Decision Making Process," Canadian Journal of Economics Political Science, 1950, Vol.16, pp.408-418 as in R.C. Srivastava, "Educational Decision making," New Delhi: Metropolitan Book Co. 1963, p.34.

Reisman and Miller¹ to plead, and Katz² to recommend that workers' do better when there is some degree of decision making about their job is possible than when all decisions are made for them³.

In a number of experiments, Lewin and his co-workers⁴ have shown that production increased on creating a social situation in which workers were, in Allport's⁵ terms, 'participant in co-operative activity'. These studies also inferred that participation facilitated the development of motivation, served to increase morale

¹ F. Reisman, Jr. and S.N. Miller, "Participation, Culture and Personality," Journal of Social Issues, 1949, Vol.5, p.1 as in *ibid*.

² Katz, "Morale and Motivation in Industry. Current Trends in Industrial Psychology," University of Pittsburg Press, as in *ibid*.

³ *Ibid*.

⁴ K. Lewin, "Group Decision and Social Change," in T.N. Newcomb and E.L. Hartley (eds), "Readings in Social Psychology," 1949, pp.330-344 in *loc.cits*.

⁵ J.R.P. French Jr., "Field Experiments Changing Group Productivity," in J.C. Miller (ed), "Experiments in Social Process," New York: McGraw Hill Book Co., 1950, pp.83-88.

and self-esteem. Similar findings are reported by
¹
 French.

²
 Coch has substantiated that workers felt more
 free to set their own work pace than those who lacked
 freedom. They also supported the fact that the quantity
 and quality of productivity corresponded to the degree
 of responsibility felt by the workers.

³
 Jans investigated the influence of organization
 factors on job involvement and specialization involvement.
 The hypothesis that rank, self-expression and partici-
 pation in decision making would affect job and specialization
 involvement was tested using a sample of three hundred and
 eighty-four Australian Army Officers in a Questionnaire
 survey. The results showed that participation influenced
 self-expression which was primarily associated with job
 involvement.

¹
 L.Coch and J.R.P.French Jr., "Overcoming resist-
 to Change," Human Relations, Vol.1, 1948, pp.512-532.

²
 Gordon Allport, "The Psychology of Participation,"
Psychologic Review, May, 1945.

³
 M.A. Jans, "Organizational Factors and Work
 Involvement," Organizational Behaviour and Human Decision
 Making Process, Vol. 35, No.3, June, 1985, pp.

¹
Hall and Foster¹ concluded that work attitudes are related to worker participation in decision making. These findings are substantiated by Lawler and Hall² in 1970; Ruh, White and Wood³ in 1973 and Steers⁴ in 1976.

⁵
Hall and Hall has demonstrated that it was the work per se and the fit between the work function and the workers' personality, self-image and opinion that was important to enhance and speed up achievement of goal.

¹
D.T.Hall and L.W. Foster, "A Psychological Success Cycle and Goal Setting: Goals, Performance and Attitudes", Academy of Management Journal, Vol.20, 1977, pp.282-290.

²
E.E. Lawler and D.T.Hall, "Relationship of Job Characteristics and Job involvement, Satisfaction and Intrinsic Motivation," Journal of Applied Psychology, Vol.54, 1970, pp.305-312.

³
R.A. Ruh, J.K. White and R.R.Wood, "Job Involvement, Values, Personal Background, Participation in Decision Making and Job Attitudes," Academy of Management Journal, Vol.54, 1975, pp.300-312.

⁴
R.R.Steers, "Factors Affecting Job Attitudes in Goal Setting Environment," Academy of Management Journal, Vol.19, 1976, pp.6-16.

⁵
D.T. Hall and F.C. Hall, "The Relationship between Goals Performance, Success, Self-Image, Involvement under Different Organizational Climates," Journal of Vocational Behaviour, Vol.9, 1976, pp.267-278.

¹ Holland¹ has substantiated that many studies have measured congruence by use of a variable, which Lawler, Lawler and Hall² called, 'opportunity for self-expression'. The present study intends to find out how willing workers are willing to participate in increasing safety (i.e. productivity) through an opinionnaire (i.e. self-expression).

In a 2 by 2 field experimental test of L.R. Hackman and G.R. Oldham's³ task characteristics model,⁴ Griffeth examined the moderating effects of a contextual variable - participation. Seventy desk receptionists participated in the redesign of their jobs, or not. The results found that participation was more limited in its effects, only affecting general satisfaction. In addition, contrary to the prediction of the model, worker participation did not enhance the effects of enriched work.

¹ J.L. Holland, "The Psychology of Vocational Choice," Waltham U.S.A.: Blais Dell; 1973.

² E.E. Lawler and D.T. Hall, loc.cit.

³ L.R. Hackman and G.R. Oldham, Work Redesign Reading: M.A. Addison-Wesley, 1980.

⁴ Roger W. Griffeth, "Moderation of the Effects of Job Enrichment Participation: A Longitudinal Field Experiment," Organizational Behaviour and Human Decision Process, Vol.35, No.3, June, 1985, pp.73-93.

The study under review purports the limitation of participation. It did not consider the willingness of the worker to participate. The present study, however, seeks to find out employees willingness to participate in a 'task characteristic' - safety activity.

Kanfer and Earley¹ examined the effects of different types of participation (choice) and role models in goal setting on goal acceptance, goal satisfaction and performance. The results of the two-way analysis variance demonstrated that goal acceptance, goal satisfaction and individual performance were highest in workers given choice over their goal and their strategy to achieve the goal.

The present study, like the study under review, aims to find out the choice of workers in the goal for safety and strategy to achieve safety. The present study, on the basis of the findings of the study under review, assumes that participation increases acceptance of and helps implementation of strategies for promoting safety.

1

F.H.Kanfer and P.C.Earley, "Informational Mechanisms of Participation Influencing Goal Acceptance, Satisfaction and Performance," Unpub. Doctoral Dissert. University of Illinois, 1964 as in *Organizational Behaviour and Human Decision Processes*, Vol.36, No.3 Dec., 1985, pp.30-34.

¹ Earley¹ inferred that trends in goal setting indicate the importance of information exchange concerning goal and task and participation.² Erez and Kanfar,² in 1983^{helped} in understanding these mechanisms. This importance³ is also inferred from studies by Latham and Steele³ in 1983 and Latham and Saari⁴ in 1979. Participation in goal setting has proven to be beneficial by Erez,⁵ Earley and Hulin,

⁶ Beehr and Love⁶ using an A₁^{two} (type of role model-role) by ^{three} A₂ (amount of choice/extent of participation-choice) completely crossed, factorial design of study,

¹ P.C. Earley, loc.cit.

² M.Erez and F.H.Kanfar, "The Role of Goal Setting Acceptance on Goal Setting and Task Performance," Academy of Management Journal, Review, Vol.8, 1985, pp.454-463.

³ G.P. Latham and T.P.Steele, "The Motivational effects of Participation versus Goal Setting on Participation," Academy of Management Journal, Vol.26, 1983, pp.406-417.

⁴ G.P.Latham and L.H.Saari, "The effects of Holding Goal Difficulty Constant on Assigned and Participative Set Goals," Academy of Management Journal, Vol.22, 1979, pp.163-183.

⁵ M.Erez, P.C. Earley and C.Hulin, "The impact of Participation upon Goal Acceptance- A Two-Step Model," Academy of Management Journal, Vol.28, 1984, pp.50-60.

⁶ T.A.Beehr and K-G.Love, "A Meta Model of Effects of Goal Characteristics Feedback and Role Characteristics in Human Organizations. Human Relations, Vol.36, pp.151-156.

also found that choice over goal setting benefitted goal acceptance, satisfaction and performance. He further suggested enhancement of comprehension of task to facilitate participation.

The present study tries to find out how much workers are willing and what they would like to learn about safety in an effort to enhance comprehension of safety activity to facilitate participation.

French, Israel and Aas,¹ in a study in Norway, obtained results similar to Vroom,² that the response of worker to participate in discussions relating to their work was significantly^{ca} influenced by whether the worker felt that participation was legitimate.

The crux of the present study, on the basis of the study under review, is determining the workers' expressed legitimacy of participating in safety activity. Their opinions on the existing safety activity, occurrence of industrial health problems in their unit, are, hence, included in the tool.

¹ J.H.P. French, Jr., J. Israel and D.Aas, "An Experiment on Participation in a Norwegian Factory," Human Relations, Vol.36, pp.151-166.

² V.H.Vroom, "The Effects of Attitudes on Perception of Organizational Goals," Human Relations, Vol.13, 1960, No.3, pp.224-240.

In conclusion, studies indicate that workers can experience health problems due to the industrial setting. Lack of adequate safety facilities, manpower, and worker motivation aggravate this situation. Participation helps to increase worker motivation to safety, decreases resistance to safety implementation and facilitates the goal towards safety. Participation depends on workers' felt legitimacy to participate. The present study, hence, seeks to incorporate worker participation in safety activity through finding out their opinion or willingness to participate in the same.

Most studies used the descriptive survey. This has hence been adopted for the present study. The factory under study - large factory and sample were likewise chosen on the basis of the review of literature. The review of literature helped to develop insight into the problem area. Review of literature has shown successful use of the paper and pencil technique. Hence present study chose this technique. The tool - an opinionnaire, was also constructed on the findings of the review of literature.

While one of the "desirable objectives of an
occupational health nurse¹" is environmental control
and safety, projects and reports directly relating
to worker participation in safety activity were
found to be limited. The present study hence is
undertaken to throw more light in this area.

¹
Eighth Report of the Joint ILO-WHO Committee on
Occupational Health. Education and Training in Occu-
pational Health, Safety and Ergonomics. TRS 663, Geneva:
WHO, 1981, pp.25-26.

CHAPTER III

METHODOLOGY

This chapter deals with the research approach and rationale, the setting, the sample and sampling, the data collection procedure and plan for analysis.

Research Approach and Rationale

The study is designed to determine the opinion of industrial workers on their participating in industrial safety activity to reduce industrial health problems.

In the initial phase of the study, literature was reviewed which helped in identifying the theoretical model relevant to the problem of this study. The second phase of the study, consisted of the development of an instrument. The next phase of the study, was devoted to the administration of the instrument. In the final phase of the study, data were tabulated, analysed, interpreted to form the basis for the findings, conclusions and recommendations of the study.

The research approach adopted was descriptive survey.¹ According to Mosser and Katton, surveys are best suited when concerned with the study of the social environment, the opinion and attitude of some group of people. They further

¹ C.A. Mosser and G. Katton. Survey Methods in Social Investigation. London: Heinemann Educational Books; 1975, p.93.

state that surveys have a clear descriptive purpose as well as a way of studying relationships in trends of opinions. Surveys have been found historically feasible as early as 1954,¹ as reports by Liverpool University indicated on its study in an industrial setting. Canter and Downham also used the survey in their study on The Communication of Ideas in Derby, 1954.² According to Verhonick and Seaman, "The descriptive survey is a process for gaining pertinent data about the existing situation. It attempts to describe a condition or learn the status of something."

With the limitations of methods of measuring opinions, one method applicable for obtaining pertinent data would be by "asking people directly how they feel about a subject".³ According to Beest and Fox,⁴ surveys also help generate new facts. It was also felt that in eliciting the opinions of workers, the facts lie as a latent reality and could best be brought to the surface through a descriptive survey.

¹ Millan. Enquiry by Samples: An Experiment and its results. Journal of Royal Statistical Society, Vol.87, pp. 544-570.

² Phyllis J. Verhonick and Catherine C. Seaman. Research Methods for Undergraduates in Nursing. New York: Appleton Century - Crofts; 1978.

³ John Beest. Research in Education. New Delhi: Prentice Hall of India (P) Ltd; 1983, p.180.

⁴ D.David Fox.

Since this study intended to gain "pertinent data" through describing and finding relationships of the opinions of workers by asking them "directly how they feel about" ¹ participating in industrial safety activity to reduce industrial health problems, the descriptive survey was used.

The Setting

A WHO/ILO Conference ² in Geneva stressed that large organizations could have a "major influence in promoting development of occupational health services development, "when there is no preexisting service of this type". This study is a harbinger of a participatory approach to safety management in factories.

The study was hence carried out in the Bharat Electronics Limited, Jalahalli, Bangalore. The criteria for selection of the factory was :

- a) the factory has more than 1000 workers.
- b) it has an established productivity reputation.
- c) it has a health service infrastructure.
- d) it has an organized Centre for Training and Development.

¹ John Bast. loc. cit.

² World Health Organization, Fifth Report on Occupational Health, Report of a WHO/ILO Expert Committee, Technical Report Series, No.354, Geneva: WHO Publications, 1967. p.

Since this study was concerned a non-health category of persons' (workers) participation in safety activity, the following criteria selected for the setting was chosen to help implement such a phenomena.

This reputed factory under study has grown from a work-force of a few hundreds in 1954 to about 13,800 at present. It has 42 departments falling under six major categories according to the type of material equipment workers are in contact with, namely,

- a) high power equipment
- b) fabrication
- c) radar
- d) soldering and electronics
- e) electronics - centre for training and development
- f) mechanical - centre for training and development

B.E.L. has an established productivity reputation. It has an organized health service infrastructure. Apart from first-aid services at the factory, the health team also helped in monitoring health risk factors at unit level. They also offered curative services in a hospital primarily for the employees and their families, which is traditionally staffed.

A centralized type of training and development department cater for all level of workers from the front-line workers to the top-managers. However, priority of training and development was focussed on mostly production supervision and management areas.

Though the safety performance statistics at the last quarter of 1984-85 indicated an improvement, they had not yielded the desired results. The accident rate of 3.6 in the factory, was far too high compared to the national average of 1.35.¹

The Sample and Sampling

A decision was made to draw the sample from front-line workers of different units. The criteria for selection of sample were:

- a) frontline workers on duty the day and time of data collection
- b) frontline workers willing to participate in the study.
- c) frontline workers representing all types of units in the factory.

¹ Safety News, BEL Publication, 1985, p.1.

The rationale for choosing this sample was that the front-line workers were directly in contact with industrial production equipment and their participation in safety activity is the focus of the study under question.

Stratified random sampling was adopted to select the sample. Firstly, one unit was chosen from each type of similar units using fishbowl random sampling technique. Six units were altogether chosen. From these six units, eleven percent of the population was similarly selected using the employees pay-roll numbers. The eventual strength of the sample per unit ranged between 10.20 percent to 11.14 percent. Drop-outs were those who refused to participate in the study and those whose opinionnaires were incomplete to be included in the study.

Table 1

Distribution of the sample by the type of unit they work in

Type of Unit	Total strength of unit	Sample Number	%
1. Electronics	350	39	11.14
2. Mechanical	350	39	11.14
3. High-power equipment	350	38	10.85
4. Fabrication	350	38	10.85
5. Radar	350	36	10.29
6. Soldering and electronics	500	51	10.20
Total	1900	241	

Most of the sample (80%) were between the age group of 21-50 years. Two third of the sample were men. Two third of the sample received an apprentice training for the job they were doing. The rest possessed a degree (4.42%) or a diploma (20%). Nearly half the sample (48.05%) had worked in the factory for more than 5 years. An almost equal proportion of workers had worked less than two years. Similarly, an almost equal number of the sample received a pay of less than Rs.800/- per month (49.55%) and a pay of Rs.801 and above. The sample characteristics are tabulated in table 2.

Table 2

Distribution of the Description of the
General Characteristics of the Sample

General Characteristics of Sample	Total	%
1. <u>Age Range in Years</u>		
Below 20	46	20
21 - 35	80	35.38
36 - 50	100	44.62
Above 50	-	-
Total	226	100
2. <u>Sex</u>		
Male	157	69.4
Female	69	30.6
Total	226	100.00

General Characteristics of Sample	Total	%
3. <u>Type of Training Received*</u>		
Apprenticeship	153	67.7
Diploma	40	17.7
Degree	10	4.42
Others	28	12.39
Total	231	100.00
4. <u>Work Experience in Years</u>		
Less than 2	104	45.02
2 - 5	16	6.93
More than 5	111	48.05
Total	231	100.00
5. <u>Pay in Rupees per month</u>		
Less than 800	112	49.56
800 - 1500	45	19.91
More than 1500	60	30.53
Total	226	100.00

*Some of the respondents possessed more than one type of training for the job they do

Table 3

Distribution of the Nature of Work of the Respondents as Expressed by them

Nature of work	Total	%
1. <u>Hours of Work per week</u>		
Below 20	6	2.59
21 - 35	23	9.54
36 - 50	190	78.84
Above 50	22	9.03
Total	241	100.00
2. <u>Work time</u>		
Only morning	102	43.04
Only evening	17	7.17
Only night	11	4.64
In shifts	107	45.15
Total	237	100.00
3. <u>Perceived work Complexity</u>		
Minimal	46	20.44
Average	100	44.44
Above average	75	33.33
Considerable	4	1.78
Total	225	100.00
4. <u>Work Interaction Pattern</u>		
Working with other workers	88	39.11
Working around other workers	90	40.00
Working alone	47	20.89
Total	225	100.00

Most of the sample (78.8%) worked 36 to 50 hours per week. The Factories Act of India, 1948 specifies a limit of 48 hours per week. Most workers fall in this category. Most of the sample work in shift duties (45.15%) or in the morning (43.04%).

Most of the sample perceived their work to be of average (44.44%) or above average complexity (33.33%). One fifth of the sample considered their work to be of minimal complexity.

Most of the sample worked with others (39.11%) or around others (40.00%). Only one fifth of them (20.89%) worked alone.

The Data Collection Process

1. The Technique : Paper and Pencil techniques was thought to be appropriate for obtaining the required information from the selected sample of workers because

- a) it could be administered to a large sample within a short time.
- b) it helped to draw free and frank responses once co-operation was obtained through clear and complete written and oral instructions and explanations.

2. The development of the Instrument : Treece & Treece¹ states that the instrument selected in a research should as far as possible be the "vehicle" that would best obtain data for drawing conclusions pertinent to the study. For the selection of items and preparation of tool, various steps were adopted, like :

¹ Treece and Treece, loc cit

- a) review of related literature
- b) consultation with experts in the field
- c) critical incidents anecdotes from workers in and out of station.

On the basis of this, it was decided that the most appropriate "vehicle" for this study would be a semi-structured opinioinaire.

The semi-structured opinioinaire prepared had four main parts:

Part A : had 11 items for obtaining general information, through structured items drawing a forced choice among multiple answers

Part B : had 3 sub-parts. The first sub-part had four items drawing a forced choice among multiple answers structured pattern derived from a modification of a tool on work. Complexity of Schillings¹ to find out how simple or complex workers perceive their work. The second sub-part was designed to find out what type of industrial health problems existed in the unit. This part on industrial health problems was semi structured requiring a tick mark for a 'Yes' response and no tick mark for a 'No' response. A remarks column for

¹
R.S.Schillings. Occupational Health Practice. London Butterworths Ltd., 1973, pp.

pertinent comments. There were also some open-ended statements to elicit specific opinions of workers on related issues.

The third sub-part had three items to find out the workers' opinions on the existing safety activity in their unit in a similar to Part B. It also had 3 items to find out whether workers felt that the occurrence of industrial health problems was a problem.

Part C : was designed to elicit workers willingness to participate in safety activity in terms of willingness to learn more on safety, seek help or take care of self for safety and actively participate in safety. Their ideal choice in safety participation was also elicited.

Part D : had items of a similar structure like Part B except one item which required six given choice to be graded according to the workers preference. If a respondent expressed unwillingness to participate in safety activity, instructions were given to proceed to Part D leaving the rest of Part C blank. Similarly, if the respondent expressed willingness to

participate only upto Knowing level, instructions were given to proceed straight to the Part E without filling up the remainder in Part D. Similar instructions were for the rest of the levels of participation expressed.

Part E: had 3 items elicit the opinion of the respondents' expected outcome of participating in safety activity.

3. Content Validity : Factors relevant to the study were identified and listed as a statement of items. This list of opinionnaire items was submitted to five experts who were asked to give their opinion of the factors identified as relevant to the study. There was provision for making their own comments in writing. post interview was held personally. Experts were selected on the basis of having experience in dealing with industrial health problems. The experts included an occupational health nurse, doctor, a safety-inspector, an engineer in a factory, and a frontline worker. Only items with 80 percent consensus among experts were retained. Their suggestions helped to add and modify some items.

4. Reliability : Test-retest method was used and percentage agreement on each item was calculated; the percentage agreement was 89.75 percent. The coefficient of concordance using Scott's formula¹ was 0.87. The tool was hence accepted as reliable on the basis of these findings of agreement and concordance.

5. Try-out of the tool: A "miniature trial run" of the methodology was planned for the main study taking a sample size of thirteen frontline workers from factories with the same criteria laid down for the study. Data was analysed and some of the difficulties ensuring were identified. Try-out revealed that the study was feasible in the setting proposed.

6. Data Collection Procedure : Formal permission for data collection was obtained from the managerial departmental heads through the guidance of the Personnel Manager and the Chief Medical Officer of the factory.

Arrangements for sampling were made with the help of the Centre for Training and Development. Formal face-to-face permission was sought from the managers of units selected. Respondents selected were asked if they were willing to participate in the study. All respondents were explained about the need for the study. Arrangements were made for the respondents to fill the opinionnaire during their duty hours. Respondents were not allowed to discuss among themselves during the time of filling up the opinionnaire. Doubts ensuring were cleared simultaneously and personally. The total opinionnaire took an average of 30 to 35 minutes to be filled up by the respondents. Data was collected from the 6th of January to the 16th of January, 1986. Two hundred and fortyone frontline workers participated in the study .

Plan For Analysis :

To fulfill the objectives of the study, the data would be analysed through descriptive and inferential statistics. Descriptive statistics using percentages will be used to fulfill objectives 1,2,3 and 5. Inferential statistics using 2 by 2 contingency tables - Chi-square will be used to fulfill objectives 3 & 4 of the study.

CHAPTER IV

ANALYSIS AND INTERPRETATION

In this chapter, the analysis and interpretation of the responses of the 241 respondents in the semi-structured opinionnaire is dealt with. This information is analysed and presented in the form of percentages and chi-square values. The whole operation is with reference to the objectives of the study and is organized under the following headings:

- A. Existing health problems as perceived by the respondents.
- B. Existing safety activity as perceived by the respondents.
- C. Expressed willingness of the respondents to participate in safety activity.
- D. Relationship of the choice of participation in safety activity expressed by the respondents and selected factors.
- E. Outcome of participating in safety activity expected by the respondents.

A. Existing Health Problems as Perceived by the Respondents

The most common health problem reported by the respondents was respiratory problems (33.91%). Some reasons cited by the respondents for respiratory problems was the inhalation of fumes from the soldering process. Factory canteen food was the reason often cited for nearly one fourth of the respondents facing gastro-intestinal problems (25.65%). The Table 4 lists the existing health problems perceived by the respondents, arranged in order of reported occurrence.

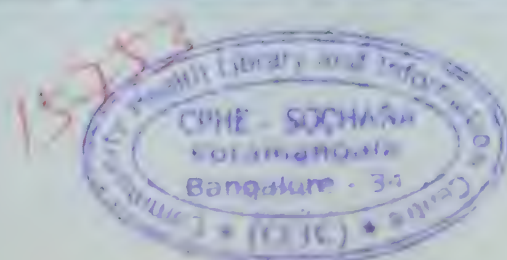
Table 4

Distribution of Common Health Problems
As Expressed by the Respondents

N = 230

Health Problems	Total	%
Respiratory	78	33.91
Gastro-intestinal	59	25.65
Psychological	51	22.17
Vision	44	19.13
Injuries	29	12.61
Electrical shocks	29	12.61
Skin	25	10.87
Burns	24	10.44
Others	15	6.52
Poisoning	8	3.48

Data from table 4 also illuminates that a common



problem experienced by the respondents (22.17%) was psychological problems. This may be related to the findings of psychogenic illness reported by in another electronics factory by Boxer, Singal and Martle.¹

Other problems stated by the respondents included low back pain and spondylosis.

The information in table 4 implies that a sizeable number of the respondents did not experience any industrial health problem. This may be consistent with their perception that environment is free of disagreeable elements and dangers. It may also be due to the workers inability to detect industrial health problems in their unit. The respiratory problems reported may be consistent with the findings of Bogdanov and Korovin². Similarly studies have reported³ gastro-intestinal problems resulting from toxic contaminants of food. Vision problems reported may be due to Jai Kiniki - Kruza's⁴ findings - "transient myopia."

¹ P.A. Boxer, M. Singal, RM Martle, loc. cit.

² N.A. Bogdanov and O.V. Korovina, loc.cit.

³ Report of the Health Hazards in Toxic Contaminants of food. Journal of Institutes of Chemists, Vol.54, No.3, May, 1982, PP.216-225.

⁴ W. Jaikinki - Kruza, loc.cit.

B. Existing Safety Activity as Perceived by the Respondents.

The existing safety activities perceived by the respondents are grouped under three sub-headings:

- 1) Regular safety activity in the respondents' unit.
- ii) Adequacy of existing safety activity.
- iii) Working conditions with reference to the presence of disagreeable elements and dangers.

These are tabulated in Table 5,6 and 7.

Table 5

Distribution of the Perception of Respondents
on Regular Safety Actions in Their Unit

N = 241

Regular Safety Actions	Number	%
a. <u>Environmental Safety Actions:</u>		
* Machines are guarded and checked for faults.	86	35.69
* Temperature, lighting, ventilation humidity are regulated	78	32.37
b. <u>Safety Education Actions:</u>		
* Workers are taught to handle new machines.	82	34.03
* Supervisor checks faulty techniques.	83	34.44
Safety education programmes are conducted.	58	24.07
c. <u>Self-care Actions:</u>		
* Workers wear safety gear prescribed	83	34.44
d. <u>Health Service Actions:</u>		
Medical examination is done in health and illness.	60	24.90
e. <u>Safety Monitoring Actions:</u>		
Unit is inspected	41	17.01

From the data in table 5, it can be deducted that only one third of the respondents, at the most, were of the opinion that safety activity was a regular feature in

¹ Items with star mark (*) show activities which involve the workers' immediate environment or work-related activities

their unit. Nearly one third of the respondents agreed that environmental safety factors were adhered to in their unit.

Under safety education actions, organized safety education courses was perceived as the least regular feature (24.07%) when compared to the perception of on-the-job safety education (34.44%).

Only one third of respondents (34.44%) acceded to the fact that workers wore safety gear prescribed. Nearly two third of the respondents did not perceived that workers wore safety gear prescribed.

A still smaller proportion perceived that health safety monitoring factors were a regular safety activity feature. Only one fourth the sample (24.9%) agreed that medical examinations were done in health and in illness.

The lowest reporting was on the monitoring of safety activity. Only 17.01% perceived that their unit was inspected regularly.

From the data in table 5, it could be deduced that safety activity which directly involved the workers' immediate environment or work related activities were perceived more frequently as a regular safety activity feature. (see items in table with star mark). However,

the data also showed that nearly two-third of the respondents did not perceived any of the above mentioned safety activity as a regular feature in their unit. These findings may be consistent with the findings of Gupta¹ and Sen.²

Table 6

Distribution of the Respondents Opinion on the Adequacy of Safety Measures in their Unit in Selected Spheres.

N = 241

Adequacy of	Total	%
Safety facilities provided	65	26.97
Worker management co-ordination	59	24.48
Workers' willingness towards safety	33	13.69
Managements' willingness towards safety.	33	13.69
Workers' job preparation	28	11.62
Safety education courses conducted	27	11.20
Safety specifications laidout	26	10.79

From the data in table 6, it can be seen that only one third of the respondents (26.97%) considered the

¹
M.M. Gupta, loc. cit.

²
R.N. Sen, loc. cit.



facilities provided towards safety adequate. A similar proportion of the respondents reported that the worker-management coordination towards safety was adequate.

A low percentage (13.69%) of respondents felt that workers' willingness towards safety was adequate. A similarly low percentage of the respondents (13.69%) felt that willingness of the management towards safety was low. These findings on low motivation towards safety ¹ may be consistent with the findings of Das.

This implies that nearly two third or more of the respondents found all the mentioned safety measures in their unit inadequate. These reported findings ² may be consistent with the findings of studies done by Mukhopadhyay, ³ Gupta, ⁴ Bhatia. This stress ^{by} reportings that occupational health services are still in their infancy and rudimentary in general and needs to be improved ^{is} dangerous.

It could also be just the reason why workers could be roped in to enable adequate safety measures.

¹

A. Das, loc.cit.

²

R.V. Mukhopadhyay, loc.cit.,

³

M.N. Gupta, loc. cit.,

⁴

J.R. Bhatia, loc.cit.,

Table 7

Distribution of the Respondents' Expressed
Opinions on the Working Conditions in
Their Units.

N = 215

Working Conditions	Number	%
Good (free from dirt, dust, heat, noise, odours, wetness, dampness, darkness i.e. disagreeable elements and dangers)	122	56.74
Average (occasional exposure to disagreeable elements and dangers)	64	29.77
Fair (frequent exposure to disagreeable elements and dangers)	16	7.44
Poor (continuous exposure with disagreeable elements and dangers)	11	5.12

From table 7, it can be deduced that more than half the respondents (56.74%) regarded the working conditions in their unit good. More than 85% of the respondents considered the presence of disagreeable elements and dangers in their working conditions either nil or minimal. Only 7.44% of the respondents considered that they were exposed to disagreeable elements and dangers frequently. Only one twentieth of the respondents (5.12%) perceived their exposure to the same to be continuous.

Summarizing the information in table 5,6 and 7, it can be inferred that the respondents may not have perceived much of the safety activity going on in their unit as they were directly not involved in existing safety activity. The reported absence of disagreeable elements and danger in their units was optimistic from the safety point of view.

A positive perception of the conditions was expected to be conducive to willingness on the part of workers to participate in safety activity.

C. Expressed Willingness of Respondents to Participate in Safety Activity.

This section deals with the responses of the respondents' willingness to participate in safety activity. These opinions are dealt with under the following areas: opinion about industrial health problems, willingness to participate in safety activity, willingness to learn more about safety, willingness to seek help when required to promote safety, willingness to take care of self for safety, and ability and willingness to activity participate in safety activity. The opinions of the workers on participating in safety activity are also dealt with here.

Table 8

**Distribution of Respondents Opinion about
the Occurrence Industrial Health Problems**

N = 207

Occurrence of Industrial health problems is/are a	Total	%
Major problem	56	27.19
Minor problem	130	62.81
Problem and a boon	16	7.73
Minor boon	4	1.93
Major boon	1	0.48

The data in table 8 indicated that more than two third (62.81%) of the respondents considered the occurrence of industrial health problems as a minor problem. Only one-fourth of the respondents considered this a major problem. This implies that a large section (90%) of the respondents considered the occurrence of industrial health problems as a problem. However, the remaining 10% considered this as a benefit also.

The reasons cited for considering this as a problem are tabulated in Table 9. Most of the respondents felt that occurrence of industrial health problems affected the productivity and the worker dismally.

Table 9

Distribution of Respondents Reasons for
Considering Occurrence of Industrial Health
Problems as a Problem

N = 207

Reasons	Total	%
Productively suffers	23	11.11
Worker suffers	39	18.84
Both suffers	110	57.01
Any other	9	4.35

Table 9 presents the major reasons for considering the occurrence of industrial health problems as a felt problem. Social unacceptance, family suffering were the other reasons stated by the 4.35% of the respondents.

However, one fifth (21%) the sample alluded to the occurrence of industrial health problems as a boon. Additional monetary compensation and paid leave were considered the silver lining by 21% of the respondents as shown in Table 10.

Table 10

Distribution of Reasons given by Respondents for Considering Occurrence of Industrial Health Problems a Boon.

N = 207

Reasons	Total	%
Additional monetary compensation	33	15.94
Additional leave with payment	28	13.52
Any other	15	7.25

If monetary benefit was viewed positively with the occurrence of industrial health problems, it is probable that it would be viewed even more positively when associated with safety or health. Incentives for safety activity could preclivate workers' participation in safety activity.

To summarize the data in table 8,9 and 10, it can be concluded that workers may not be apathetic to safety activity participation because they find the occurrence of industrial health problems burdening.

C.2. Respondents' Expressed Willingness to Participate In Safety Activity.

From the analysis of the respondents willingness to participate in safety activity, as shown in Table 11, it is promising to note that 92.10% of the respondents expressed willingness to participate in safety activity.

Nearly two-third (65.18%) of the respondents expressed willingness to participate in safety activity always. About one sixth of the respondents expressed willingness to participate in safety activity most of the time (16.07%) or sometime (12.95%) as shown in Table 11.

Table 11

Distribution of Respondents Expressed Willingness to Participate in Safety Activity

N = 224

Extent of Willingness	Number	%
Always	146	65.18
Most of the time	36	16.07
Sometimes	26	12.95
Never	13	5.80

With more than 80% of the respondents considering the occurrence of industrial health problems as a problem, (table 8) the data in the Table 11 implies ^{that} the workers are motivated to participate in safety activity because its a felt need. Only

one twelfth of the respondents expressed unwillingness to participate in safety activity. This willingness or reported motivation to participate could be developed through allowing them to participate in safety activity¹ as studies indicate.

C.3. Respondents Expressed Willingness to Learn more about Safety

Table 12

Distribution of Respondents Expressed Willingness to Learn More About Safety

N = 211

Learn more about safety	Number	%
Willing	187	88.63
Unwilling	24	11.37

From the ^{data in} Table 12, it was evident that most of the respondents (88.63%) were willing to learn more on safety. An open-ended question on specifying what exactly respondents would like to learn more about was answered by most respondents as follows according to frequency:

- i. first aid management
- ii. safe practices
- iii. detection of risk factors in unit

¹ L.Coch and J.R.P. French, Jr, loc.cit.

- iv. detection of health problems
- v. effective communication
- vi. safety equipment

In response to the mode of learning preferred by the respondents willing to know more, as shown in Table 13, more than half the sample preferred organised courses on safety.

Table 13

Distribution of Mode of Learning Preferred
by the Respondents Willing to Learn More
on Safety

N = 187

Mode of Learning	Number	%
Independent learning	17	9.09
On the job	54	28.88
Through organised safety	110	58.82
Worker group courses study	28	14.97
Any other	4	2.14

From the data in Table 13, it is evident that one fourth the respondents preferred to learn on the job. 14% preferred group study while one tenth of the respondents (9.09%) preferred independent learning. Four respondents (2.14%) preferred learning through mass media visuals.

Table 13 emphasises the responsibility placed on the decision makers for safety activity in promoting knowledge of safety. No one mode of learning would ^{be likely to} suit everyone. Provision for independent learning and peer group study were also given importance to by the respondents. This is consistent with the adult learning principles and trends today.

Table 14

Distribution of Respondents Willingness to Attend a Formal Short Term Course on Safety, if Offered.

N = 204

Willing	Number	%
Always	57	27.94
Most of the time	67	32.84
Sometimes	70	34.31
Never	10	4.91

Though 45% of the respondents (Table 13) preferred group or independent study, yet the data in table 14 show that only 4.9% disagreed to attend a formal short term course on safety. Nearly one third of the respondents were willing to attend a formal short term course always (27.94%), most of the time (32.84%) or sometimes (34.31%).

Several studies¹ have shown that knowledge increases compliance. This acquiescence to attend a formal short term course on safety implies that workers are eager to learn more in an organised quick manner in order to facilitate their participation in safety activity.

Table 15

Preference of Respondents on Teachers
to Teach them about safety

N = 211

Teacher preference	Total	%
Safety Officers	50	23.7
Managers	46	22
Health team	41	19.32
Supervisors	38	17.01
Workers themselves	34	16.28
Others	2	0.70
	211	100

From the responses of respondents as listed in table 15, it can be deducted that safety officers are most preferred person as a teachers (23.7%) with managers second (22%), health team, third (19.32%) and supervisors fourth (17.01%).

Table 15 enlightens on an interesting fact that is consistent with their preference for peer group learning expressed in table 13, that is, workers themselves were preferred as teachers about safety by a sizeable 16.28% of the respondents.

From table 15, it is clear that the workers' expectations lie on all the categories as educators in safety. Safety officers were preferred by a mere 1.7% more than managers and a minimal 3.38% more than the Health team and 5.8% more than supervisors and just 7.42% more than workers themselves. This table shows that the responsibility to teach workers about safety was not perceived to lie with only safety officers or managers or Health Team. A team teaching approach is most likely to be preferred. The responsibility preferred was a collective responsibility which included worker responsibility equally.

¹
Beahr and Love suggested enhancement of comprehension of task to facilitate participation. The findings in tables 12, 13, 14 and 15 dealing with workers acknowledged need to "enhance comprehension", may hence facilitate participation. This may also assist in "information exchange"² concerning safety which will facilitate participation.

¹
T.A. Behr and KG Love, loc. cit.,

²
P.C. Farley, loc. cit.

C.4. Willingness to Seek help to Promote Safety

Table 16

Distribution of the Respondents' Willingness
and Situations when they are Willing to Seek
Help to Promote Safety

N = 211

Seek help to promote safety	Number	%
<u>Opinion</u>		
Willing to seek help when required for safety	200	98.58
Not willing	3	1.42
<u>Situation when willing to seek help</u>		
Facing problem with machine	74	35.07
Facing problem with health	59	27.96
Facing problem with coworkers	9	4.27
Facing any other problem	3	1.42
	211	100

From the data in table 16, we can deduce that almost one third the respondents expressed willingness to seek help when faced with trouble with their machines (35.07%), health (31.28%) and co-workers (27.96). With nearly 79.11% of the respondents working with or around others (Table 2) a third of them (27.96%) admitted to needing help when faced with problems with co-workers. Only 1.42% expressed reticence to seeking help to reduce industrial health problems.

The data in table 16, implies that the respondents are well aware of their limitations. The fraction of respondents who were unwilling to seek help may have stemmed from those who abhor admitting to such limitations. Nevertheless, if conditions are made for allowing workers to seek help, a positive perception on part of workers to participate in safety is expected.

C.5. Willingness to take care of self for safety

Table 17

Distribution of Respondents' Willingness to
Care of Self for Safety

N = 195

Willing	Number	%
Always	140	71.8
Most of the time	27	13.85
Sometimes	27	13.85
Never	1	.50
	195	

The data in table 17 indicated that most of the respondents preferred taking care of themselves for safety always (71.8%) to caring for themselves for safety most of the time or sometimes (13.85%). Only one (0.5%) respondent refused to take care of self for safety.

From the data in table 17, it can be inferred that almost all the workers are self-care oriented (99.3%) and willing to take responsibility for themselves towards promoting safety.

If ability to take care of self for safety, is promoted, or if situations promoting self-care exist, this vital aspect of self-care may be solely placed on the workers for promotion of safety or reducing industrial health problems.

C.6. Respondents expressed willingness and ability to actively participate in selected safety activity

The willingness of the respondents to participate in selected safety activity implies their alleged legitimacy to participate. This is based on the findings of French, Israel and Aas¹ who found that the response of workers to participate was significantly influenced by whether the worker found that their participation was legitimate. To find out their self estimated ability also to participate in the same selected safety activity is attempted here.

The analysis between the willingness and ability reported by the respondents is presented in terms of chi-square values in tables 18, 19, 20, 21, 22 and 23.

¹ JRP French, Jr., J. Israel and D. Aas, loc.cite.,

Table 18

Chi Square Showing the Relationship of the Percentages of Respondents to Encourage Others to follow Safety Specifications in their Unit.

			N = 228
	Willing	Not willing	Total
able	33.33	16.67	50
not able	29.82	20.18	50
Total	63.15	36.85	100

$$\chi^2 = 0.006 \quad df = 1 \quad 0.05 < \text{level}$$

Data in Table 18 indicate that one third of the respondents (33.33%) expressed willingness and ability in encouraging others to follow safety specifications. More than one fourth the respondents (29.82%) expressed their willingness but expressed inability to encourage others to follow safety specifications. This shows that nearly two third the respondents (63.15%) were willing. Nearly one sixth the respondents (16.67%) expressed ability but were unwilling to encourage others to follow safety specification in their unit. At least one fifth of the respondents (20.18%) were neither willing nor able to do the same. From this, it can be concluded that while nearly one third of the respondents (36.85%) expressed unwillingness, half the respondents (50) expressed in ability to encourage others to follow safety specifications in their unit.

Chi square value of 0.005 and df 1 implied that there was no significant association between the respondents expressed willingness to encourage others to follow safety specifications, if needed, in their unit. Their willingness is high, yet they did not perceive themselves able.

Considering that more than two thirds of the respondents *reported* they worked with or around others (table 1), and more than two thirds expressed needed to learn more about safety (table 12), proper training and encouragement may help to harness their ability to promote safety through active participation.

Table 19

Chi-Square Showing the Relationship of Percentage of Expressed Willingness and Ability to take Initiative to Add More Safety Specifications, if needed

	Willing	Not willing	Total
able	28.51	8.33	36.84
not able	35.53	27.63	63.16
Total	64.04	35.96	100

N = 220

$$\chi^2 = 5.005 \quad df = 1 \quad 0.05 > \text{level}$$

From the data in Table 19, it can be inferred that nearly one third the respondents were either willing and able to (28.51%) or neither willing nor able to (27.63%) take initiative to add more safety specifications, if needed. A rather large proportion

if the respondents (35.53%) expressed willingness, in spite of not being able to take initiative to add more safety specification. From table 19, it can be deduced that while two third of the respondents were willing to (64.04%) but not able to (63.16%), nearly one third the respondents expressed unwillingness (35.96%) in spite of being able to (36.84%) take initiative to add more safety specificate if needed.

The Chi square value showed that there is a significant association between the respondents' expressed willingness and ability in taking initiative to add more safety specification if needed in their unit.

This information along with the data in table 12 and suggest that respondents are aware of their lack of knowledge of safety and if this gap be rectified, the willingness of the respondents could be utilized for this very important aspect of safety activity.

Table 20

Chi Square Showing the Relationship of Percentage of Workers' Expressed Willingness and Ability to Teach New Workers'

			N = 228
	Willing	Not willing	Total
able	25.44	21.49	46.93
not able	32.9	20.17	53.07
Total	58.34	41.66	

$$\chi^2 = 0.842 \quad df = 1 \quad 0.05 < \text{level}$$

The data presented in table 20 shows that only one fourth of the respondents (25.44%) expressed both willingness and ability to teach new workers safety techniques while nearly one third of the respondents (32.9%) expressed willingness but were unable to teach new workers safety techniques. An almost equal proportion of the workers estimated themselves as able and were yet not willing (21.49%) to teach new workers safety techniques. Nearly one fifth of the respondents (20.17%) were neither willing nor able to teach new workers safety techniques.

This shows that nearly three-fifth the respondents (58.34%) expressed willingness to teach new workers safety techniques. Nearly half the respondents expressed ability (46.93%). Chi value of 0.842 at $df = 1$ shows that there is no significant association between the respondents

expressed willingness and ability to teach new workers safety techniques. This implies that expressed ability to teach new workers safety workers may not influence willingness in this particular safety activity. Motivation and training are need areas if workers are to be utilized actively in this aspect. It may also call for new workers to be taught safety techniques from other people, likely to be preferred as in table 15.

Table 21

Chi Square Showing the Relationship of Percentages of Respondents' Expressed Willingness and Ability to Demonstrate Safety Techniques to a Group

N = 228

	Willing	Not willing	Total
able	12.28	18.86	31.14
not able	37.28	31.58	68.86
Total	49.56	50.44	100%

$$\chi^2 = 1.90 \quad df = 1 \quad 0.05 < \text{level}$$

Data presented in table 21 indicate that only one eighth of the respondents (12.28%) expressed willingness and ability to demonstrate safety techniques to a group. A sizeable proportion of the respondents (37.28%) expressed their willingness in spite of feeling unable to demonstrate safety techniques to a group. An almost equal proportion of the respondents (31.58%) expressed inability and unwillingness to demonstrate safety techniques.

This shows that, once again, the respondents express more willingness (49.56%) than ability (31.14%) in participating in this safety activity, conversely expressed inability to demonstrate safety techniques to a group (68.86%) is more felt than reticence to do so (50.44%).

Chi-square value of 1.90 with a df of 1 shows that there is no significant association between expressed willingness and expressed ability to demonstrate safety techniques to a group.

The results consistently shows that respondents' expressed willingness to actively participate in safety activity is more than their self estimated ability to do so. A potential field for workers' active participation in safety activity would hence call for promoting skills to increase ability.

Table 22

Chi Square Showing the Relationship of Percentages of the Respondents Expressed Willingness and Ability to Identify Risk Factors and Report it

N = 220			
	Willing	Not willing	Total
able	20.18	17.54	37.72
not able	32.46	29.82	62.28
Total	52.64	47.36	100%

$$\chi^2 = 0.0096 \quad df = 1 \quad 0.05 < \text{level}$$

Data in table 22 indicate that only one fifth of the respondents (20.18%) expressed willingness and ability to identify risk factors in their unit and report it. Nearly one third of the respondents (32.46%), expressed their willingness in spite of feeling unable to identify risk factors in their unit and report it. An almost equal proportion of the respondents (29.82%) expressed inability and unwillingness to actively participate in this specified safety activity.

From the data in table 22, it can be concluded that while more than half of the respondents (52.64%) expressed willingness, only one third of the respondents (37.74%) expressed ability for the same activity. Though two thirds of the respondents (62.28) expressed inability, only half of of the respondents (47.36%) expressed unwillingness. This

shows that willingness to actively participate in this particular safety activity, has a slight advantageous edge over respondents unwillingness to participate in this safety activity.

Chi square value of 0.0096 at df 1 shows that there's no significant association at 0.05 level between the respondents' expressed willingness and ability to participate in identifying risk factors in their unit and reporting it.
¹ Since studies indicate that even sleeping more than nine hours at night being less than 25 years are risk factors for occurrence of one industrial health problem (hand injuries), workers' participation in this aspect will be beneficial.

Table 23

Chi square Showing the Relationship of Percentages of Workers' Expressed Willingness and Ability to Identify and Rectify Risk Factors in Their Units themselves

	Willing	Not willing	Total
able	17.11	17.54	34.65
not able	28.51	36.84	65.35
Total	45.62	54.38	

N = 220

$$\chi^2 = 0.00310 \quad df = 1 \quad 0.05 < \text{level}$$

The data in table 23 indicate that hardly one fifth of the respondents (17.11%) expressed willingness and ability

to identify and rectify risk factors in their units themselves. However, more than a quarter of the respondents expressed willingness even though they were unable to identify and rectify risk factors in their units themselves. A rather large proportion of the respondents (36.84%) expressed both reticence and inability to identify and rectify risk factors in their units themselves.

From data in table 23, it can be deduced that two third of the respondents (65.35%) expressed inability and half of the respondents expressed reticence to identify risk factors. Out of the 45.62% of the respondents who expressed willingness, only 34.66% the respondents expressed ability to do the same. This shows again that expressed willingness is more than the expressed ability in identify risk factors and rectifying themselves.

χ^2 value of .00318 with a df of 1 indicates that no significant association was found between the respondents expressed willingness and ability to identify and rectify risk factors in their unit themselves. Since workers are the first contact with risk factors, this data implies that strengthening the motivation and ability of workers' is imperative before they can identify and rectify risk factors in their units themselves. They may only then, be utilized in self managed safety activity.

Summary of the choice of participation expressed by the respondents is given in Table 23 A.

Table 23 A

The Choice of the Respondents on Willing-
ness to participate in Safety Activity

N = 230

Willing to	Total	%
<u>Passively Participate</u>		
- learn more	25	10.87
- seek help	32	13.91
- take care of self	17	7.39
<u>Activity Participate</u>		
- organise some aspects	108	46.96
- manage all aspects	35	15.22
<u>Not willing to participate</u>	13	5.65
	230	100.00

Table 23A indicates that most of the respondents (46.96%) preferred to organise safety activity. The next majority of respondents (15.22%) prefer to manage safety activity. On the whole nearly two third of the respondents preferred active participation to passive participation. Nearly one tenth the respondents preferred to passively participate in safety activity.

Only one tenth of the respondent expressed reticence to participate in safety activity.

Summarizing the findings of data¹ in tables 18, 19, 20, 21, 22 and 23, ^{and 23A;} it is clear that in all selected safety activity, respondents were more willing to actively participate in safety activity than were able to. The data also presents that the respondents expressed more inability than unwillingness to actively participating in safety activity.

From this data emerges an optimistic finding that workers participation in safety activity is a concrete possibility if facilities to improve their abilities are provided.

C.7. Respondents' Ideal Choice of Participation in Safety Activity

Apart from their willingness to participate in safety activity, respondents were also asked what they felt was the best choice of participating ideally in safety activity. This is tabulated in tables 24, 25 and 26.

¹ See Appendix G, pg 136.

The first part of the paper discusses the importance of the study. It highlights the need for a comprehensive understanding of the subject matter. The second part of the paper presents the methodology used in the study. It describes the data collection process and the analysis techniques. The third part of the paper discusses the results of the study. It presents the findings and discusses their implications. The fourth part of the paper concludes the study. It summarizes the main points and provides recommendations for future research.

The study was conducted in a systematic and rigorous manner. It involved a thorough review of the literature, a careful selection of the sample, and a detailed analysis of the data. The results of the study are presented in a clear and concise manner. They show that there is a significant relationship between the variables studied. This finding has important implications for the field of study.

The study also identified some limitations. These include the small sample size and the lack of control over some of the variables. Despite these limitations, the study provides valuable insights into the subject matter. It suggests that further research is needed to explore the relationship between the variables in more detail. The study also provides some practical recommendations for the field of study.

In conclusion, the study has shown that there is a significant relationship between the variables studied. This finding has important implications for the field of study. The study also identified some limitations and suggested areas for further research. The study provides some practical recommendations for the field of study.

Table 24

Distribution of Respondents Opinion on the
Best Choice of Participating in Safety
Activity

N = 228

I		
Industrial health problems can best be reduced if -	Total	%
<u>PASSIVE</u>		
- Managers take responsibility to implement safety activity.	34	14.91
- Workers have adequate knowledge on safety.	29	12.72
- Workers protect themselves adequately.	25	10.97
- Workers seek help when needed.	23	10.09
<u>ACTIVE</u>		
- Workers and management work together to plan, organize, implement, evaluate safety activity.	96	42.11
- Workers take responsibility to implement safety activity.	42	18.42
- Workers take initiative to organize safety activity.	11	4.83

The data in table 24 clearly indicated that workers felt safety activity was most effective if workers and management jointly planned, organized, implemented and evaluated safety activity (42.11%). Only one sixth of the respondents felt that the responsibility for effective safety activity had to remain with the management (14.91%). A relatively larger proportion acceded to the fact that the

responsibility for effective safety activity (18.42%) lies with the worker. Only 4.83% of the respondents felt safety activity to be a sole worker responsibility. Nearly one third of the respondents felt that passive participation would best reduce industrial health problems.

The data in table 24 hence implied that the respondents are realistically aware that a worker-management collaborative safety activity was the most viable means to reduce the occurrence of industrial health problems. This finding was congruent to the recommendations of many reputed organizations today.¹

Table 25

Distribution of Respondents' Willingness to Obey Safety Specifications Laid Down by Management, Workers or Both.

N = 201

Willingness to obey safety specifications laid down by	Total	%
Management and workers together	141	66.83
Management only	31	14.69
Workers only	23	10.94
Others	6	2.84
	201	100.00

Consistent with the preference to participate in safety

¹ Canadian Public Health Association, loc. cit.

activity two-third of the respondents (66.83%) preferred obeying safety specifications laid down (or formulated) by the management and workers together. The 14.69% who preferred the management only and 10.9% who preferred the workers laying safety specifications may be likely to obey safety specifications laid down by a participatory approach involving both the groups preferred. Only 2.84% preferred the health team, section-heads, outside bodies laying down the specifications.

Table 26

Distribution of Respondents Opinion on Best Participation-non-participation to Prevent Industrial Health Problems

N = 221		
Industrial health problems is best prevented if	Total	%
Workers only take responsibility for this	25	11.31
Machines are guarded adequately	30	13.58
Management only takes responsibility for this	54	24.43
Both workers and management take responsibility for this	115	52.04
	221	99.96

More than half of the workers (52.84%) opined that worker participation with management is best to prevent industrial health problems. About one fourth of the workers (24.43%) regarded management autonomy best. One tenth of the respondents

(11.31%) felt that the best way to reduce industrial health problem is workers working on this with autonomy and responsibility. 13.58% remained neutral stating machines being guarded was sufficient to ensure safety.

This finding in table 26 is consistent with the respondents' preference for a participatory approach to safety management.

D. Relationship of the Respondents Express Willingness to Participate in Safety Activity and Selected Factors

1

Studies on participation have often reiterated that worker participation has facilitated in developing motivation, morale and self esteem in the worker. The resulting effect on the achievement of safety through worker participation may hence seen inevitable.²

This section attempts to analyse the choice of worker participation expressed by workers in terms of active and passive participation. Passive participation alludes to the willingness to only "learn more on safety," seek help when needed to promote safety and take care of self for safety as expressed by workers. Active participation refers workers willingness to actively participate in safety activity.

The relationship of preferred choice of participation and age of the respondents, pay received by respondents, training received by respondents, type of work interaction in their unit,

1

R. Tannerbaum and F. Messerick, loc. cit.

2

Gertrude Zemon Goss, loc. cit.

their perceived work complexity, perceived working conditions and the outcome of participation expected by respondents is dealt with in tables 27, 28, 29, 30, 31, 32, 33, 34 and 35.

Table 27

Chi square Showing the Relationship Between Respondents' Expressed Choice of Participation and their age.

N = 215

	↓ 35 years	↑ 35 years	Total
Passive Participation	38	36	74
Active Participation	63	58	141
Total	121	94	215

$$\chi^2 = 2.707 \quad df = 1 \quad 0.05 < \text{level}$$

Chi square value of 2.707 (df=1) shows that no significant association was found between the respondents' choice of participation and their age. The data in table 27 reiterates that participation is acceptable and is independent of age. It implies that as respondents grow older, they do not significantly opt for active participation, or passive participation. Each respondent chooses the type of participation regardless of age.

It implies that strategy for worker participation in safety, in terms of active and passive participation, can choose any worker, regardless of age.

Table 28

Chi square Showing the Relationship of the Respondents' Expressed Choice of Participation and the Pay they Received per month

			N = 215
	Below Rs.1500/-	Above Rs.1500/-	Total
Passive Participation	47	26	73
Active Participation	102	40	142
Total	149	66	215

$$\chi^2 = 0.00598 \quad df = 1 \quad 0.95 < \text{level}$$

No significant association was found between the expressed choice of participation and the pay the respondents received.

This, once again, implies that the urge to participate is universal, regardless of the pay received. This infers that with a rise in pay, respondents would not necessarily exercise their choice towards active participation.

From the data in table 28, it can be concluded that pay need not be a harbinger factor in selecting workers to actively participate in safety. This finding is optimistic for safety, in that it implies that any worker regardless of pay may be willing to actively participate in safety activity.

Table 29

Chi Square Showing the Relationship of Respondents Expressed Choice of Participation and type of Vocational Training they received

N = 218

	Apprenticeship	Others	Total
Passive Participation	56	17	73
Active Participation	120	25	145
Total	176	42	218

$$\chi^2 = 0.575 \quad df = 1 \quad 0.05 < \text{level}$$

The data in table 29 indicate absence of a significant association between the respondents choice of participation in safety activity and type of training they received for the job they do. This implies that a worker with a graduate training was as equally motivated towards participation in safety activity as a worker with apprenticeship training. It implies that the type of training does not relate with apathy towards safety activity.

Since most of our work force hold apprenticeship backgrounds, this finding is a fore-runner to using these workers for participating in safety activity - the motivation is there to be tapped, usefully.

Table 30

Chi Square Showing the Relationship of Respondents Expressed Choice of Participation and their Work Interaction in the Unit

N = 235

	Working alone	Working with or around others	Total
Passive Participation	8	65	73
Active Participation	24	138	162
Total	32	203	235

$$\chi^2 = 6.4562 \quad df = 1 \quad 0.05 > \text{level}$$

Data from table 30 indicate that there is a significant association between the respondents choice of participating in safety activity and their working alone or in a group.

From this, we can imply that respondents tend to be willing for active participation when working with or around others. This may be due to a recognition of the impact of the occurrence of industrial health problems on workers around them. Those working alone may be insulated from what others suffer from.

This data also implies that workers' active participation may be called for, if those workers work with and around other and passive participation suffices for those working alone. Motivating those working alone to actively participate may also be thought of.

Table 31

Chi Square Showing the Relationship of the Respondents Expressed Choice of Participating in Safety Activity and their Expressed Knowledge of the Factories Act of India, 1948

			N = 224
	Not under- stood	Understood	Total
Passive Participation	19	52	71
Active Participation	57	96	153
Total	76	148	224

$$\chi^2 = 2.3825 \quad df = 1 \quad 0.05 < 1$$

Data in table 31 shows that there is no significant association between workers choice of participating in safety activity and their knowledge of the Factories Act of India, 1948.

This implies that workers choice of participating in safety activity does not differ with the awareness of their legal rights. This may be due to their pragmatic scepticism about the effectiveness of legal procedures in terms of effecting safety activity. It could also mean that the need to participate is a fundamental need regardless of any secondary legal stimulation.

Table 32

Chi Square Showing the Relationship of the Respondents Expressed Choice of Participation and Their Perceived Work Complexity

N = 211			
	Below Average	Above Average	Total
Passive Participation	54	15	69
Active Participation	75	67	142
Total	129	82	211

$$\chi^2 = 12.6520 \quad df = 1 \quad 0.05 > \text{level}$$

The data in table 32 shows that there is a significant association between the respondents choice of participation and their perceived work complexity. It implies the respondents who perceived their work to be below average in complexity opted significantly for passive participation. Those who perceived their work to be of considerable or above average complexity significantly expressed willingness to participate actively in safety activity.

This implies that work enrichment measures or job advancement, specialization measures may stimulate workers active participation in safety activity. That job specification and participation are related is a finding in Griffith's¹ study.

¹ Roger W. Griffith, loc cit.

Table 33

Chi Square Showing the Relationship of Respondents Expressed Choice of Participation in Safety Activity and Their Working Conditions as Perceived by them

N = 213

	Fair or Poor	Good or Average	Total
Passive Participation	14	58	72
Active Participation	13	128	141
Total	27	186	213

$$\chi^2 = 3.6758 \quad df = 1 \quad .005 < \text{level}$$

The data in table 33 indicate that there is no significant association between the respondents choice of participating in safety activity in a unit where presence of disagreeable elements and dangers were perceived to be continuous and considerable or completely absent.

This shows that in spite of perceiving their unit to be free of disagreeable elements and dangers, workers opted to participate uniformly between active and passive participation. It also implies that presence of considerable amounts of disagreeable elements and dangers did not necessarily stimulate the workers to prefer active participation to passive participation in safety activity.

Table 34

Chi Square Showing the Relationship of Respondents' Choice of Participating in Safety Activity and Type of Rewards Expected to Reduce Industrial Health Problems in their Unit

			N = 212
	Monetary	Non-monetary	Total
Passive Participation	7	60	67
Active Participation	44	101	145
Total	51	161	212

$$\chi^2 = 9.93 \quad df = 1 \quad 0.05 > \text{level}$$

Data in table 34 indicate that there is a significant association between respondents choice of participating in safety activity and the type of reward they expect in a successful effective participation in safety activity.

It implies that workers expressing willingness towards active participation significantly tends towards non monetary rewards like recognition, certificates, medals, promotion. This implies that recognition, self esteem are more sought after in participating in safety activity. This finding is consistent with studies¹ that associate participation to improve morale self esteem, self expression.

It also implies that monetary benefit may not be given priority when trying to motivate workers towards active participation in safety activity.

¹ L. Lewin, loc. cit.; O.T. Hall and Foster, loc.cit.

Table 35

Chi Square Showing the Relationship of Respondents
Choice of Participating in Safety Activity and the
Outcomes Expected in Participating in Safety Activity

N = 204

	Will not reduce industrial health problems markedly	Will reduce in- dustrial health problems markedly	Total
Passive Participation	27	39	66
Active Participation	31	112	143
Total	58	151	209

$$\chi^2 = 8.329 \quad df \ 1 \quad 0.05 > 1$$

The data in table 35 indicate that there is a significant association between the respondents choice of participating in safety activity and the outcomes expected in participating in safety activity. This means that those workers who feel that their inclusion in safety activity would markedly reduce the occurrence of industrial health problems significantly opted for active safety participation.

It may be inferred that the reason why respondents choose to limit their participation to just learning more on safety, seeking help or taking care of self for safety was because they felt their active participation would ^{not} make a difference on the occurrence of industrial health problems.

To summarize tables 27, 28, 29, 30, 31, 32, 33, 34 and 35. A significant association was found between the respondents expressed choice of participation and worker interaction in the unit, perceived working conditions, perceived work complexity, type of rewards expected and outcome of participating in terms of occurrence of industrial health problems.

No significant association was found between the respondents choice of participating in safety activity and age, training background, expressed knowledge of factories Act of India, 1948, and pay received by them. These factors are difficult to modify. Hence, the fact that no association was found between these factors and participation in safety activity rings an anticipatory bell for including workers in safety activity.

E. Respondents Expected Outcome of Participating In safety Activity

This section deals with the respondents expected outcome of participating in safety activity in terms of rewards and reduction of industrial health problems in table 36 and 37.

Table 36

**Distribution of the Respondents Opinion on Rewards
for Reducing Industrial Health Problems**

N = 241

Opinion	Total	%*
Reward		
1. - reward workers	117	48.55
- reward unite	45	18.67
- reward both	28	11.62
2. reward with		
- money	52	24.19
- promotion	44	20.47
- certificate, medal	100	46.52
- others	17	7.92
No need to reward	26	10.79

* The percentage will total more than 100 because some respondents have expressed more than one choice of reward.

The data in table 36 shows that respondents expected to be rewarded personally (48.55%) with medals and certificates preferably (46.52%) for reducing industrial health problems in their unit. Nearly one fifth of the respondents expressed that unite also be rewarded and an equal proportion of respondents specified monetary or promotion as the reward. Only a minimal 10.79% of the respondents felt that rewarding is necessary.

This implies that 90% of the respondents expected to be rewarded for reducing occurrence of industrial health problems in their unit. This in itself could hence be the incentive to motivate workers to participate in safety activity effectively.

Table 37

Distribution of Respondents' ^{Opinions} on Outcome of Their Participation in Reducing Industrial Health Problems in the Unit

Respondents' participation in safety will reduce occurrence of industrial health problems	Total	%
Very significantly	92	38.17
Significantly	67	27.80
A little	25	10.37
No (will not reduce)	25	10.37

Data in table 37 shows that more than one third of the respondents (38.17%) expected a very significant reduction in occurrence of industrial health problems with their participation in safety activity. Only a tenth of the respondents (10.37%) felt that the occurrence of industrial health problems would remain status quo in spite of their participation.

From the data in table 37 it can be inferred that nine tenth of the respondents felt that their participation would reduce the occurrence of industrial health problems. This finding is consistent with a similarly large percentage of respondents willing to participate in safety activity (see table 24) and hence expressing a need to know more on safety (see table 25).

The 10.37% who do not see any change with their participation could be those who have preferred management autonomy in safety activity. It could be also based on realistic actualities today when nearly two thirds of the workers have expressed inability in participating in selected safety activity (see Appendix G). It could be based on these facts that 10.37% of the respondents were sceptical about their participation reducing the occurrence of industrial health problems in their unit.

Summary of Findings

To summarize findings of the present study, consistent with the willingness to participate reported in many studies, the workers expressed willingness to participate in safety activity in terms of willingness to "learn more on safety," "seek help" and "take care of self for safety" and actively participate in organizing ^{safety activity. They} expressed more willingness to participate in safety activity in spite of expressing in-

ability to do the same. Their choice of participation was independent of age, pay received and their awareness of legal rights. The choice of participation was, however, significantly associated with their perception of nature of work and outcomes expected participating.

These findings suggest that involving workers participation is safety activity, apart from being an ideal proposition in reducing industrial health problems, is also a practical solution to the present dilemma.

CHAPTER V

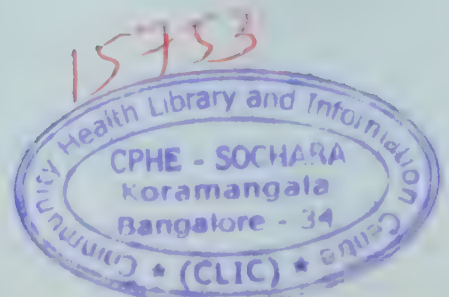
SUMMARY, CONCLUSION, IMPLICATION AND RECOMMENDATION

Summary

This study was a descriptive survey in nature. It has been conducted with a view to find out the opinion of workers on their participation in safety activity. The study was confined to six units of an electronics factor in Bangalore.

The objectives of the study was to identify existing industrial health problems and existing safety activity as reported by the workers. It also aimed to describe the opinion of workers on participating in safety activity. Analysis of the choice of participation preferred by the workers in association with selected factors was also attempted.

Review of literature indicated that industrial health problems existed by virtue of the industrial environment. They substantiated that the occurrence of industrial health problems was further aggravated by inadequate safety facilities in terms of manpower, finance and equipment. Low motivation of workers to safe practices due to their non inclusion in safety activity magnified the already dismal situation.



Participation stimulated motivation, facilitated identification and encouraged self expression towards a qualitative and quantitative achievement of a goal. Hence worker participation in safety activity was assumed to contribute to the prevention of the occurrence of industrial health problems.

However, studies indicated that willingness to participate depended on the legitimacy of participating in safety activity felt by the workers. This study attempted to find the willingness to participate in safety activity as expressed directly by the workers themselves.

The study was conducted using a sample of 241 workers selected through stratified sampling technique. The tool used was a semi-structured opinionnaire. Data was collected from the 6th to the 16th of January, 1986.

The data obtained for the present study was analyzed according to the objectives of the study and interpreted under the following headings :

1. existing health problems perceived by the workers.
2. existing safety activity perceived by the workers.

3. expressed willingness of workers to participate in safety activity.
4. relationship of their expressed willingness to participate and selected factors.
5. outcome of participating in safety expected by workers.

Findings

The following conclusions drawn on the basis of the study are discussed below, according to the objectives of the study :

1. Existing health problems perceived by the workers

Two thirds of the workers reported no occurrence of industrial problems in their unit. The three most common problems reported by the workers were in the respiratory, gastro-intestinal, and psychological areas. Vision problems were also reported. The reasons for vision problems may be related to the reasons reported by Jaikineki-Kruza¹ in his study on transient myopia. Similarly the respiratory problems reported by the workers is substantiated by the findings from a study by Bogdanov and Korovina².

¹ W.Jaikineki - Kruza, loc. cit.

² N.M.Bogdanov and O.V. Korovina, loc.cit.

Psychological problems reported in this study may be consistent with the findings of psychogenic illness in a study¹ conducted by Boxer, Singal and Martle.

2. Existing safety activity as perceived by the workers

Safety activity that directly involved the immediate environment of the workers and their work were perceived more frequently by them. Only one third of the workers agreed that safety activity was a regular and adequate activity in their units. However, more than four fifths of the workers considered that their environment to be free of disagreeable elements and dangers. That the facilities for safety are inadequate in factories were also emphasized by the findings² of Bhatia. Numerous newspaper reports alluded to this as well.

3. Expressed willingness of the worker to participate in safety activity

Nine tenth of the workers felt that the occurrence of industrial health problems was a problem because either the worker or the productivity suffered.

¹ PA Boxer, M.Singal and R.M.Hartle, loc cit.

² J.R.Bhatia, loc.cit.

³ Times of India, Mar.20, 1984; Jansatta, March 20,1984.

More than four fifth of the workers were willing to participate in safety activity, that is, they found their participation in safety activity legitimate. These findings were consistent with those of Reisman and Miller¹ who then recommended worker participation to increase productivity.

Most of the workers expressed their willingness to learn more about safety, first aid management, identify risk factors and early detection of health problems. Most of the workers preferred to learn about safety on the job and through organized short term courses. Almost all the workers expressed willingness to attend a short term course on safety, if it was arranged for them. Their preference for teachers to teach them about safety was juxtapositioned with safety officers highest, managers second, the health team third, the supervisors fourth and the workers themselves fifth, that is, only a mere of 6.69 percent preferred safety officers to workers themselves.

Nearly all the workers expressed willingness to take responsibility for themselves for ensuring safety and seek help when facing problems with the machines, health and co-workers.

¹ F. Reisman, Jr and S.N. Miller, loc. cit.

Nearly one third the workers expressed preference to participate in safety activity passively. Two third of the workers opted to participate actively in safety activity.

Workers expressed willingness to participate actively in safety activity irrespective of their self-estimated inability to encourage others to follow safety specifications, take initiative to add more safety specifications, teach or demonstrate safety techniques to new workers or a group of workers and identify or rectify or report risk factors in their unit.

These findings were consistent with the findings of Lewin and his co-workers.¹ Worker participation in other spheres relating to productivity is an established and welcomed fact. These findings hence indicated that worker participation in safety activity was perceived in a similar vein. This finding alludes to an opening of optimistic avenues for the achievement of safety (goal) through worker participation in safety activity.

Most workers felt that industrial health problems could be best reduced if workers and managers planned, organized, implemented and evaluated safety activity together.

¹ K. Lewin, loc. cit.

4. Relationship of the choice of participation expressed by the workers and selected factors

No significant relationship was found between the workers expressed choice of participation and age, pay received by them, type of training they received for the job they did and their expressed knowledge of the Factories Act of India, 1948.

The choice of participation expressed by workers was positively related to their perceived working conditions, their working in groups in their job, their perceived work complexity and their expectation of the outcome of participating in safety activity. These findings are consistent with the finding of Jans.¹

5. Outcome of participating in safety activity expected by workers

Nearly all the workers expected to be rewarded personally or as a group (units) with certificates or medals (rather than monetary benefits), if their participation facilitated safety.

Nearly all the workers expected their participation in safety activity to reduce the occurrence of industrial health problems.

¹
N.A.Jans, Loc.cit.

Conclusions

The most important common health problems are in the area of respiratory, gastro-intestinal and psychological areas. The workers are not consistently aware of the safety activity in their unit. They have not always felt able to actively participate in safety activity. Yet their they have expressed willingness to participate in safety activity.

Implications

Since one of the primary functions of an occupational health nurse is assisting in safety activity and promotion of workers' health, the findings of this study imply that she may try to utilize these front line workers in participating in safety activity. Health personnel in occupational settings are minimal. Worker participation in safety actively will help to lessen the work load.

Based on the reporting of workers on the existence of respiratory, gastro-intestinal psychological problems, the nurse may stimulate, plan, and carry out a study on its causes, making full use of available resources (safety officers, managers) and report findings. She may also facilitate in its preventive strategies.

Based on the findings of the reported inadequacy in safety activity, the nurse may assist in making an actual observational check in all the units. She may also facilitate workers to become aware of the safety activity in their unit, if a discrepancy lies in their reported perception and actual observations. She may assist in monitoring and maintaining adequate safety facilities in the units.

Based on the findings that workers are willing to participate passively or actively in safety activity, she may facilitate workers to learn more about safe practices, first-aid, safety devices and communication through team teaching involving safety officers, managers, supervisors, other members of the health team and the workers themselves. She may guide them to suitable appropriate reading material on safety. She may provide relevant learning experiences by collaborating with the manager, section-heads, supervisors towards on-the-job situational safety learning also. She may involve them in propagating learning of safety among the workers also.

She may be alert to symptoms of chronic or acute occupational diseases. She may also provide adequate help in terms of listening, guiding, counselling, referring and conferring if worker seeks her help when faced with problems with machines, health or coworkers.

She may facilitate management in providing an appropriate environment for the workers to take care of themselves. She may monitor encourage and re-inforce them to self care for safety activity.

Based on the findings that the expressed willingness of the workers exceeds their self estimated ability to participate in safety activity, she may incure a sense of self-enquiry in the workers to promote independent interest-based learning. She may induce safety awareness through enurtiating a safety factotum approach as per need of the unit. She may study and report learning needs of workers assist worker in gaining skill in first-aid management, communication and safe practices to forford industrial health problems.

Based on the findings th t there was no significant association between workers choice of participation and age, pay received knowledge of the Factories Act of India, 1948, she will not make these the distinguishing characteristic in choosing workers to actively participate in safety activity. She may motivate and involve them to actively participate in safety activity regardless of their age and pay.

Based on the findings that there was a significant association between workers working alone (passive participation) and working in groupe (active participation), she may assist in identifying the informal leader of the workers in groupe and help and guide in their active participation

of safety activity. Because of the significant association between perceived work to be simple (passive participation) and very complex (active participation), she may stimulate managements and the centre for Training and Development to propagate worker job enrichment, especially in functional jobs, like in the assembly lines. Because of the significant association between choice of participation and benefits expected i.e. non monetary benefits (active participation) and monetary benefits (passive participation) she may support the use of non-monetary benefits to stimulate more workers to participate actively in safety activity. Because of the significant association between workers' perception that their participation will increase safety (activity participation), reinforcement on workers' participation in promoting safety with examples from related areas elsewhere (e.g. Norway, Japan, USA) may help motivate more workers to actively participate in safety activity.

Because the nurse seeks to "promote symphonic interaction"¹ between the worker and his environment, she may have to take into account the findings of the present study in contributing to safety activity because the worker is "free to choose (his) ways of living health" - and participation in safety activity is his/her choice.

¹

Martha E Rogers, loc. cit.

Limitation

1. Sample under study was limited to frontline workers mostly with apprenticeship trained background.
2. The study considered the existence of health problems and safety activity in the factory as reported by the workers only.
3. Generalization of the findings are limited to the factory under study.

Recommendations

This has been the beginning of a systematic approach to the study of worker participation in safety activity in factories. In view of the findings reported in the study, the following recommendations are offered:

1. Further study should be done to determine whether comparable results would be obtained with a worker population in other factories.
2. Same study can be done using empirical observation to corroborate the existence and nature of industrial health problems and safety activity.
3. An Experimental study on the effects of worker participation in safety activity can be conducted.

4. An investigation into the causes of respiratory, gastro-intestinal and psychological problems reported by the workers can be conducted.
5. A study to identify the learning needs of workers to facilitate their participation in safety activity can be conducted.
6. More research is need to explore the nature of worker participation in safety activity. This investigation looked at opinions of workers participation in safety activity. It may be of value to explore the nature of worker participation.
7. Further studies should be done to compare worker participation behaviour with data obtained from records documents and management opinions.
8. Factors that facilitate and hinder worker participation in safety activity can be investigated.
9. A study to develop a course outline for different types of short-term courses on safety can be considered.
10. A study to develop a self-instructional module on safety practices can be undertaken.

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Dated, the : 21 Sep 1985

To

The Chief Medical Officer
Bharat Electronics Limited
Jalahalli
Bengaluru.

Dear Madam/Sir,

This is to introduce Miss E. Washington who is a student of the Master of Nursing Course at the College of Nursing, New Delhi. She has been given an assignment in "Nursing Research" by her subject teacher.

The student is in need of your esteemed help and co-operation. I request you to kindly extend the necessary facilities to her at your institution to enable her to work on assignment.

Yours faithfully,

Sd/-
(Mrs. B. Bhattacharya)
Principal.

Tele. 6436788

No.11-8/85
Government of India
Rajkumari Amrit Kaur College of Nursing
Andrews Ganj, New Delhi-110049.

Dated, the 27 Dec, 1985

To

General Manager
Bharat Electronics Limited
Jalahalli
Bangalore.

Sir,

This is to introduce Ms. Edwina Washington a (Final Year) student of Master of Nursing Course in this college. She has selected the following topic for her research project, to be submitted to University of Delhi in partial fulfilment of University requirements for the award of Master of Nursing Degree.

Topic: "An Exploratory Study to find out the opinion of Workers on Their Participation in Reducing Industrial Health Hazards, Preventing Industrial Diseases and Injury in Factories in Bangalore".

Ms. Washington is in need of your esteemed help and cooperation as she is interested in conducting her study in the selected organization. I am to request you kindly extend necessary facilities to her in your organization to work on the proposed study.

Further information in this regard, if required, will be furnished by the student personally.

Yours faithfully,

Sd/-
(Mrs. B. Bhattacharya)
Principal

TELE. 6436788.

MISS EDWINA WASHINGTON
MASTER OF NURSING

R.A.K. COLLEGE OF NURSING,
NEW DELHI 110049.

Dt. 2 January, 1986.

Madam/Sir,

A study is being conducted to find out the feasibility to alternatives to the present health care system in the industries for which it is necessary to know your valued opinion.

Working day in and day out in factories, all of you face certain dangers to health that lead to injuries and diseases. I am referring to these dangers as "Industrial health hazards" or IHH in my study.

You are requested to help me by filling up this opinionnaire as truthfully as you can, keeping the conditions you work in, in mind.

I thank you all for taking time and effort to help me conduct this study.

Yours sincerely,

(Edwina Washington)

INSTRUCTIONS

1. Place a tick mark whenever you feel that is the answer ✓
2. Some statements require you to make a choice among few statements. You are to tick mark along side the statement closest to what YOU think is right
3. Wherever "specify" is written, you are to expand your answer in points.
4. You may ask for additional paper to state your opinions more fully.
5. This opinionnaire will be used for the purpose of research only. Confidentiality is strictly assured.
6. Kindly write you unit and designation in the space below.
7. Do not leave any statement unanswered.

Part A : GENERAL INFORMATION

INSTRUCTION: Place a tick mark in the line alongwith the most appropriate statement in your work situation, according to you.

1. I work in

B.E.L.

H.A.L.

H2M.T.

M.I.C.O

2. My age is

less than 20

21 - 30

31-50 years

3. Sex

Male

Female

4. My pay per month is

Below Rs.800/-

Rs.800/- 1500/-

Above Rs.1500

5. The type of training I received for the work, I do now, was-

Apprenticeship

Diploma

Degree

Others, specify

6. The hours I work per week is:

Below 20

21 - 35

36 - 50

Above 50 hrs

7. I am a member of the Union

Professional Association

Other, specify

8. I work with others:

Around others

Alone

9. I have been working for:

Less than 2 yrs

2 - 5 yrs

More than 5 yrs

10. I have read the Factories Act 1948
and understand it:

Fully

Most of it

Some of it

None of it

Not Read

11. I work in the :

Morning _____

Evening _____

Nights _____

In shifts _____

Part B I : COMPLEXITY OF TASK PERCEIVED:

INSTRUCTIONS: From the four statements below choose the statement that describes your work MOST appropriately (/)

1. My Work:

_____ is simple and repetitive and performed according to instructions. or

_____ involves planning and organization and actions relating to production. or

_____ involves variety of duties performed according to procedure but requiring alertness to identify needs. or

_____ involves variety of complicated duties and some independent actions, and adopting procedures to specifics. or

2. My work involves:

_____ normal manual skills—eg., lifting, pushing. or

_____ minimal manual skills or

_____ above average manual skills eg., manipulation. or

_____ considerable manual skills—eg. carrying heavy loads.

3. My work requires

- _____ mental efforts to solve problems in my area. or
- _____ mental effort to make decisions in most difficult times or
- _____ little thinking or judgement or
- _____ some alertness while performing repetitive tasks as per directions. or

4. My work involves

- _____ light work physically, usually seated. or
- _____ little more physically, seated at times. or
- _____ Average physical effort, interrupted activity or
- _____ physical effort, continuous activity or

Part B II: EXISTING INDUSTRIAL HAZARDS, DISEASE AND INJURY:

INSTRUCTIONS: Tick mark the line alongside the statement that is most appropriate in your unit:

1. The common health problems in your unit are:

- _____ Vision problems
- _____ respiratory problems
- _____ skin problem
- _____ electric shocks
- _____ gastro-intestinal problems
- _____ burns
- _____ injuries
- _____ poisoning
- _____ psychological problems
- _____ others.

3. My working conditions are

- _____ Good (light, ventilation good, free from dirt, dust, heat, noise, odours, wetness/dampness, that is, disagreeable elements and dangers) or
- _____ Average (occasional exposure to disagreeable elements and dangers) or
- _____ Fair (frequent exposure to disagreeable elements and dangers) or
- _____ Poor (continuous exposure to disagreeable elements dangers)

Part B IV. PERCEPTION AS A HEALTH PROBLEM

INSTRUCTIONS: Tick mark the line alongside, against which you consider the MOST APPROPRIATE

1. Do you think the industrial disease or injury occurring in your unit is a.

- _____ major problem or
- _____ minor problem or
- _____ a problem and a boon - a prize or
- _____ a minor boon - or prize
- _____ a major boon - or prize

2. If it is a PROBLEM, is it because

- _____ the worker suffers; or
- _____ the productivity suffers; or
- _____ both suffer; or
- _____ any other, specify.

3. If it is a BOON is it because of

- _____ additional monetary compensation or
- _____ additional leave with payment; or
- _____ any other, specify.

Part C LEVELS OF PARTICIPATION EXPRESSED:

INSTRUCTIONS: Tick mark in the line alongside, the most appropriate statement **IN YOUR OPINION:**

1. In your opinion, industrial hazards can be reduced, industrial disease any injury can **BEST BE** prevented by:

_____ machine being well-maintained or
 _____ management laying down safety rules and workers obeying them or
 _____ workers alone forming safety rules and obeying them or
 _____ workers with management working together on this aspect.

2. Are you willing to help reduce industrial hazards, prevent industrial disease or injury?

Always or _____
 Most of the time or _____
 Sometime or _____
 Not willing _____

If your Answer to the above is "Not willing" please turn to the last page Part E. You are not required to answer the rest of the questions in this Part C. Those answering any one of the other three questions, please continue further questions in this part C.

- 2.a. Do you think you ought to learn more to help reduce industrial hazards, prevent industrial diseases or injury?

Yes or _____
 No _____

- b. If Yes, specify on what points exactly you would like to know.

- 2.c. What do you think is the most convenient way for you to learn about this?
(Tick Mark the most appropriate Answer)

_____ by self-learning with the help of books, or

_____ by on-the-job teaching by the supervisor, safety officer, or

_____ by organised, regular courses on this aspect in your factory by qualified personnel; or

_____ by workers studying by themselves and discussing with other workers, or

_____ any other method, specify.

- 2.d. To what extent would you attend a formal in-service education programme, if it were offered?

Always or _____

Most of the time or _____

Some time or _____

Never _____

- 2.e. Who in your opinion would be the most appropriate person or team to offer such a programme. (In the lines below, place the line MOST PREFERRED).

_____ the supervisors; or

_____ the health team; or

_____ the safety officers; or

_____ the management; or

_____ the workers themselves or

_____ any other specify.

- 2.f. Give three reasons for your answer:

1.

2.

3.

3.a. Are you willing to take care of yourself in order to prevent industrial hazards, disease or injury:

Always or _____

Most of the time or _____

Sometimes or _____

Not willing _____

4.a. Are you willing to seek help when you face:

_____ slight problems with your machine,

_____ slight problem with your health;

_____ slight problem with your co-workers

_____ anyother, specify.

4.b. Are you willing to obey safety specifications laid down (Choose the MOST APPROPRIATE Statement)

_____ by management only; or

_____ by a group of workers only; or

_____ by a group of workers only management; or

_____ by any others, specify.

5.a. INSTRUCTIONS: Below are two lines for each statement you have to answer. If you are "Willing to" and "able to", then tick mark both the lines. If you are "Willing to" but not "able to", then tick mark only the "willing to" column line and vice-versa.

In Your Unit Are You _____ Willing to Able to

- take initiative to add more safety specifications, if needed

_____ and/or _____

- | | <u>Willing to</u> | <u>Able to</u> |
|---|--------------------|----------------|
| - Encourage other to follow safety specifications, if needed. | _____ and/or _____ | |
| - teach new workers safety techniques. | _____ and/or _____ | |
| - demonstrate safety techniques to a group. | _____ and/or _____ | |
| - identify risk factors and | _____ and/or _____ | |
| - rectify risk factors yourself | _____ and/or _____ | |
| - anything else, specify | _____ and/or _____ | |

Part D. **INSTRUCTIONS:** Tick mark the line of the most appropriate to statement in Your Opinion.

In your opinion industrial health hazards can be reduced and industrial diseases or injuries can be prevented if

i) if

_____ workers have adequate knowledge of safety techniques; or

_____ workers protect themselves adequately; or

_____ workers seek help when needed; or

_____ workers take initiative to organise sessions in this regard in their unit; or

_____ workers and management work together to plan, organise and implement health hazards preventive measures; or

ii) if _____ managers take responsibility to implement preventive measure or

_____ workers take responsibility to implement these programmes;

Part E: OUTCOME EXPECTED:

1. Do you think workers and unit who succeeded in reducing industry health hazards should be rewarded:

Workers

Yes or _____

No _____

Units

Yes or _____

No _____

2. If YES specify reward, as mentioned below

_____ monetary reward or

_____ certificate medal or

_____ promotion or

_____ others specify:

3. Do you think workers participation in preventing industrial health hazards, disease or injury will reduce their occurrence
(Tick Mark the line of the most appropriate answer.)

_____ very significantly or

_____ significantly or

_____ a little or

_____ no (that is, will reduce their occurrence).

APPENDIX E

Chi Square values have been calculated to find the relationship between choice of participation preferred by respondents and selected factors as shown below

Chi square showing the relationship of respondents expressed choice of participating in safety activity and type of training they received for the job they do.

	N = 218		
	Apprentice- ship	Others	Total
	(A)	(B)	
Passive participation	56	17	73
	(C)	(D)	
Active participation	120	25	145
Total	176	42	218

$$\begin{aligned}
 \chi^2 &= \frac{N \times (AD - BC)^2}{(A+B)(B+C)(C+D)(D+A)} \quad \text{where N = total number of respondents} \\
 &= \frac{218 \times (1400 - 2040)^2}{176 \times 42 \times 145 \times 73} \\
 &= \frac{218 \times 640 \times 640}{176 \times 42 \times 145 \times 73} \\
 &= 0.575
 \end{aligned}$$

$$\chi^2 = 0.057 \quad df = 1 \quad 0.05 \quad \text{level}$$

Similarly calculated for tables

APPENDIX 'F'

¹
Scott's formula is also used to find out the reliability of opinion tools. A ratio of 0.85 and above is accepted as reliable.

The formula is :

$$\pi = \frac{P_o - P_e}{1 - P_e}$$

Where, P_o is the proportion of agreement P_e the proportion of agreement expected by chance and π is the coefficient of observer agreement.

¹W.A. Scott. Reliability of content analysis: The case of nominal scale coding. Publ Opin. Quart., 1955, 19, 321-325 cited in N.L. Gage (ed.) Hand Book of Research on Training. Chicago : Rand Mc Nally and company 1963, p.273.

APPENDIX 'G'

Summary of the Distribution of the percentage of Respondents
Willingness and ability in Active participation Safety Activity
in their units.

N = 228

df = 1

Safety activity	Willing and Able	Willing but Not Able	Able but Unwi- lling	Neither Willing Nor Able	χ^2
1. Encourage others to follow safety specifications.	33.33	29.82	16.67	20.18	0.006
2. Take initiative to add more safety specifications, if needed.	28.51	35.53	8.33	27.63	5.004
3. Teach new workers safety techniques.	25.44	32.90	21.49	20.17	0.842
4. Demonstrate safety techniques to a group.	12.28	37.28	18.86	31.58	1.90
5. Identify risk factors and report it.	20.18	32.46	17.54	29.82	0.0096
6. Identify risk factors and rectify it.	17.11	28.51	17.54	36.84	0.0032

ABSTRACT

A descriptive survey to find out the opinion of industrial workers on participating in safety activity was conducted by Edwin Washington for the Partial fulfilment of the requirements for the degree of Master of Nursing at the RAK College of Nursing, New Delhi in April, 1986.

The objectives of the study were to identify the existing industrial health problems as perceived by the workers; to find out the existing safety activity as perceived by the workers; to find out the opinion of workers on participating in safety activity; to find the relationship between the willingness to participate in safety activity and selected factors and to find out what outcomes workers willing to participate in safety activity expected as a result of their participation.

The theoretical base for the conceptual framework of the study was primarily Martha Rogers.

The study was conducted on 241 frontline workers, selected through stratified sampling technique in a factory in Bangalore. A semistructured opinionnaire were used to collect data.

Descriptive (percentages) and inferential statistics (chi square) were used for the analysis of data.

The findings revealed that the three most commonly reported industrial health problems were respiratory, gastrointestinal and psychological problems. Two third of the workers considered the safety activity in their unit to be inadequate. Nearly all the workers were willing to participate in safety activity. Only 13 refrained from expressing willingness to participate in safety activity. One third of the workers preferred passive participation, that is, willingness to learn more about safety, willingness to seek help when needed for safety and willingness to take care of self for safety. Two third of the workers preferred active participation in safety activity, that is willingness to organize and manage a elected safety activity.

They reported more willingness to actively participate in safety activity than ability to. A management - worker collaborative planning, organizing, implementing and evaluating safety activity strategy was preferred.

Their choice of participation - active or passive participation in safety activity was independent of their age, their expressed knowledge of the Factories Act of India, 1948, the pay they receive.

Their choice of participation in safety activity was significantly influenced by whether they worked alone (Passive) or not alone (active); whether they perceived their unit to be free of disagreeable elements and dangers (active) or not (passive); whether they perceived their work to be repetetive, that is, below average complexity (passive) or considerable or above average complexity (active); and whether they perceived that their participation in safety activity would reduce the occurrence of industrial health problems markedly (active) or not make a difference on their occurrence (passive). Non-monetary benefits were preferred significantly by those willing to participate actively than monetary benefits (passive).

The findings suggest that workers have a positive attitude towards participating in safety activity. They feel that industrial health problems could be reduced with their participation in safety activity.

Recommendations

This has been the beginning of a systematic approach to the study of worker participation in safety activity in factories. In view of the findings reported in the study, the following recommendations were offered:

1. Further study should be done to determine whether comparable results would be obtained with a worker population in other factories.

6. More research is needed to explore the nature of worker participation in safety activity. This investigation looked at the opinions of workers participation in safety activity. It may be of value to explore the nature of worker participation.

Implication

Priority should be apportioned to facilitate workers to participate actively in safety activity.

